OFFICE OF INDIAN AFFAIRS

FARM AND HOME MECHANICS

SOME THINGS THAT EVERY BOY SHOULD KNOW HOW TO DO AND HENCE SHOULD LEARN TO DO IN SCHOOL

DEPARTMENT OF THE INTERIOR

WASHINGTON
GOVERNMENT PRINTING OFFICE
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R. G. Valentine, *Commissioner.*

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INTRODUCTION.

Nearly every Indian boy when at home lives in the country rather than in town, and therefore is more or less closely in touch with farm life. The majority of these boys have their own land, and this majority should ultimately make their living from this land. To do that requires that they live the lives of farmers. There are many simple processes which the white boy who is brought up on a farm learns incidentally at home that the Indian boy has no opportunity to learn there, but which he must know how to do if he is to make a real success of his farming.

The boy who devotes himself entirely to a trade may become proficient in that trade, and yet may lack in the general knowledge of doing these common things that are so necessary to the farm and home.

A suggestive list is given containing a number of common articles that have to be made for every home and on every farm, together with a number of processes with which every boy should be familiar. There are localities to which not all of these suggestions may apply, and it will be desirable to add to this list some things that are applicable only to certain local requirements. It is not the purpose of the bulletin to furnish any complete list or complete course, but merely to give suggestions as to what may be done, with the expectation that the live instructor will add to the lists as his experience may show him is advisable.

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The earnest cooperation of all employees is requested in carrying out and adding to the plan as outlined.

Sample record card (face.)

Name.......................... Age.......... Tribe....................
Date of entry.................... Term .... School grade.............

Article.	Date.	Process.	Date.	Remarks.
	1907.		1907.	
1	Sept. 25	1	Oct. 6	
7	Oct. 3	2	Nov. 13	
10	Oct. 15	9	Nov. 17	
2	Nov. 20	4	Dec. 15	
11	Nov. 20	5	Dec. 15	
12	Nov. 20	6	Dec. 15	
3	Dec. 10			
			1908.	
	1908.	3	Apr. 17	
23	Jan. 5	17	June 12	
13	Feb. 2	11	Oct. 2	
4	Mar. 30	10	Dec. 15	
18	June 15			
17	Sept. 30		1909.	
27	Oct. 25	21	Feb. 20	
31	Nov. 5	12	May 13	
14	Nov. 30	16	June 11	
20	Dec. 20	23	June 15	
		13	Oct. 18	
	1909.	19	Nov. 3	
5	Jan. 30	20	Nov. 3	
6	Feb. 25			
24	Mar. 29		1910.	
9	Apr. 19	18	Jan. 7	
8	May 27	8	Mar. 5	
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Sample record card (reverse.)

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ARTICLES TO BE MADE.

1. Bread board.
2. Stall, feed box and manger.
3. Hen's nest.
4. Hen roost.
5. Gate.
6. Chicken coop.
7. Milk stool.
8. Evener.
9. Trough, feed.
10. Trough, water.
11. Shelf, wall.
12. Shelf, hanging.
13. Footstool.
14. Flour box.
15. Bench.
16. Knife box.
17. Table.
18. Cupboard.
19. Towel roller.
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21. Window screen.
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apart. Fill the frame with concrete, the mixture being 1 part cement, 2 parts clean, coarse sand, and 4 to 6 parts broken stone, which should be tamped in until the water begins to show on top.

The finishing coat should be 1 inch thick and of 1 part cement to 1½ or 2 parts good, clean, coarse sand. This should be spread before the concrete base has set and should be smoothed off with a straightedge, flush with the surface of the scantling frames. Smooth with a wooden plate and cut into square blocks with groover. In warm climates where the concrete is likely to expand, a seven-eighths-inch board should be set in across the walk about every 50 or 60 feet to the depth of the frame. Fill into this, and before the concrete has firmly set, but when it will stand, the board should be removed and the space filled with dry sand.

Cover the completed walk with sand or other convenient material to keep it from drying too rapidly and to protect it from dust and the sun.

15. LAYING STONE WALL.

No wall should be less than 18 inches thick. The largest stones should be in the foundation course, and as many stones as possible that go through the wall should be used. Fragments of stones may be used for filling in.

No joint between two stones should come over a joint between other two stones, but the stone should overlap from 1 to 1½ times the depth of the course.

Stones should be laid in the wall as they lay in the quarry.

All dry and coarse stones should be moistened before they are laid in order that the stone may not absorb the moisture in the mortar, and thus dry it too fast. Every part of the joint of all the spaces between the stones should be filled with mortar, but these spaces should be made as small as possible. After the mixture is laid the joints in the face should be cleaned out and refilled with cement mortar. The joints should be thoroughly cleaned to the depth of at least half an inch, but an inch is much better. A mixture of 1 part cement, 1 of sand is, perhaps, most commonly used.

16. HANGING DOORS.

The door is held up against the jambs and marked around with a pencil. It should then be cut to these lines, being made about one-eighth inch narrower and three-eighths inch shorter than the opening. The upper hinge should be about 6 inches from the top and the lower one about 10 inches from the floor. The thickness of the plinth or the casing should be subtracted from the total width of the hinge, and the balance divided by two will give the distance the hinge is to be set back from the face side of the door. In all cases the hinge should be wide enough to reach across two-thirds of the thickness of the door. The jamb should be at least 1½ inches thick or else be backed up solidly, so as to give the hinge screws a good hold; 1¼-inch screws should be used for common size doors. Heavy doors should have three hinges. The mortise for the hinge of the door should bevel slightly toward the front, so that the hinge will not strike the jamb.

17. SETTING LOCKS.

Rim locks are those that are simply screwed onto the face of the door, while mortise locks are those that are set into the door itself. In setting the former, the lock is held in position and marked for the keyhole, knob-bar hole, and screw holes. The first two are cut and the last are bored, and the lock screwed into place. The escutcheon and knob plates are put on, and the keeper is then put onto the jamb. For a mortise lock, the lock is set in the door with a mortise just large enough to admit it, the face plate of the lock being set flush with the face of the edge of the door. The places for the holes for the knob bar and keyhole should then be marked and cut, the lock set and fastened in, the knob-plates and escutcheon set, and the knobs adjusted. The keeper is then mortised into its proper place flush with the face of the edge of the jamb.

18. PAINTING AND GLAZING.

Composition of paints: Paint is composed of two ingredients, the pigment, which gives body and color, and the fluid in which this color is dissolved or suspended. If the painting is for protective purposes, the fluid is oil; if for decoration only, it may be water.

The best white pigment is pure white lead, while the most common black pigment is lamp black. Pigments that will give the different colors and shades of color may be used as desired.

The oil most commonly used by painters is linseed oil, the drying qualities of which are improved by boiling, when it is commonly known as boiled oil. Its quality can be determined by looking through a small bottle filled with it. Good, fresh oil should be clear in appearance and have very little odor; poor oil is not clear and has a strong and rancid odor. If paint is too thick, good oil should be used to thin it. Driers are frequently used in order to cause the paint to dry more readily; in fact, some colors will not dry at all without their use.

A varnish is a solution of a gum or resin in turpentine, linseed oil, or some like fluid, and is used to produce a hard and shining surface. A cheap varnish suitable for ordinary work can be made as follows: Add 2½ pints of turpentine to 3 pounds of dried resin, shake well and allow to stand for a day or two, shaking occasionally. Add 5 quarts of boiled oil; shake thoroughly and allow to stand in a warm room until clear; then pour off the clear portion and it is ready for use.

Before beginning to paint, the surface to be painted should be thoroughly cleaned, and all spots and dust removed. The knots should be covered with shellac, which can be easily obtained, and all nail holes, bad joints, and cracks should be filled with putty.

New woodwork should receive at least three coats of paint. The first coat is called the priming and should be thin and readily absorbed into the wood. The stopping up of the nail holes, etc., should be done after the priming is applied.

The intermediate coats should then be applied as evenly as possible, the second coat being laid at right angles to the grain of the wood, while the third coat should follow the grain, care being taken to leave no brush marks. The final coat should give the desired tint.

In repainting old work, it should be carefully cleaned with a knife and then gone over with powdered pumice stone and water, rubbing the greasy parts with lime.

Whitewash is used for common walls and ceilings where, for sanitary reasons, a frequent application is better than a coat which would last longer. It is made from pure white lime, mixed with water and is improved by adding a pound of pure tallow to every bushel of lime. Lime for whitewash should be slaked with boiling water and, when slaking is complete, the lime can be dissolved in water and applied with a common whitewash brush. Whitewash is improved by adding 2 pounds of zinc sulphate and 1 pound of common salt to every half bushel of lime used.

Whitewash can be tinted to any color desired by the use of tints, which are readily procured.

In setting a pane of glass to replace a broken one, care should be taken to remove all pieces of the old putty, which can be done with a knife or with a hot iron. When the glass has been fitted, a thin layer of putty should be put on the frame and the pane of glass pressed into place against this. This prevents the glass from touching the wood and renders it less likely to be broken. The putty should then be applied smoothly with a putty knife. Glazier's points should be used to hold the glass in place until the putty is applied.

Putty can be made from whiting and linseed oil, but can be more readily bought already prepared.

19, 20. BUILDING ROADS.

The first and most essential feature in road building is to secure good drainage, since water is the agent which does most damage. The road should be shaped like a roof, with the highest part in the middle and sloping evenly in both directions. On a hill side this may not be possible and the road will have to have only one slope, but generally speaking, a roof-shaped road is entirely practicable.

There are many kinds of road machines in use, all of which are more or less expensive, but the simplest apparatus for building and keeping a dirt road is good condition is the split-log dray (figure 33). This simple implement can be used very easily and effectively and can be made and owned by any farmer.

Wherever a draw or ditch crosses a road, a culvert of some sort must be put in. This may be made of stone, if such material is available, but is most commonly a plain box, made of planks. The size of this culvert is regulated entirely by the volume of water that is likely to pass through it during a rain storm. It should be set into the road so that its bottom will be on a level with the bottom of the ditch or drain that crosses the road, and the road above it should be kept fully up to grade.

21. GLUING.

Surfaces to be glued should be forced as closely as possible together and as little glue as possible should be used. The less the better. Glue should be applied hot and it is also well to warm the joint when practicable.

Good glue may be known by the way it breaks under the hammer. The more ragged the fracture the better the glue. The best method of making glue is to fill the inner vessel with small pieces of glue, cover them with water, and allow them to soak for a few hours. Glue should be applied hot and so thin that it will run off the brush almost like linseed oil.

22. SOLDERING.

Soldering is uniting two pieces of metal by means of another metal. The parts to be joined should be thoroughly cleaned by scraping or filing, and a flux must be used with the solder to join the two metals. This flux may be borax or resin, but muriatic acid is commonly used and is easy to handle. Resin is the best flux for tin; muriatic acid for zinc and galvanized iron; borax for iron and steel. The acid is kept in a small bottle with a piece of iron wire through the cork, dipping into the fluid, so that a drop may be applied to the surface of the metal to be soldered when desired.

The soldering iron must be kept tinned or it will not spread the solder. A few small scraps of tin are mixed with some resin in a hollow place in a brick or some similar place, and the hot iron is rubbed into this mixture until the tin has melted and adhered to the iron through the agency of the resin. A good-sized iron should always be used.

When the surfaces to be brought together are prepared, the soldering iron should be heated to a dull red and should then be rubbed clean on a piece of rag and applied to the solder in such a way that the melted solder will cover the place to be mended. The solder should be then rubbed smooth from the joint with the iron, care being taken that it be not too hot.

23. HARNESSING, HITCHING, AND UNHITCHING HORSES.

Always handle your horses gently. Always speak to them before you go into the stall. Do not throw the harness on them as they do not enjoy being hurt. Always be sure that all buckles are fastened and that the ends of the straps are put into the keepers. In hitching a horse or a team to a vehicle, the traces should be the last things fastened, the lines being taken down first, so that the animals are always under control.

In unhitching, exactly the reverse process is followed, the lines being the last part of the harness to be put up.

In unharnessing a team, the buckles should always be loosened on the left-hand side.

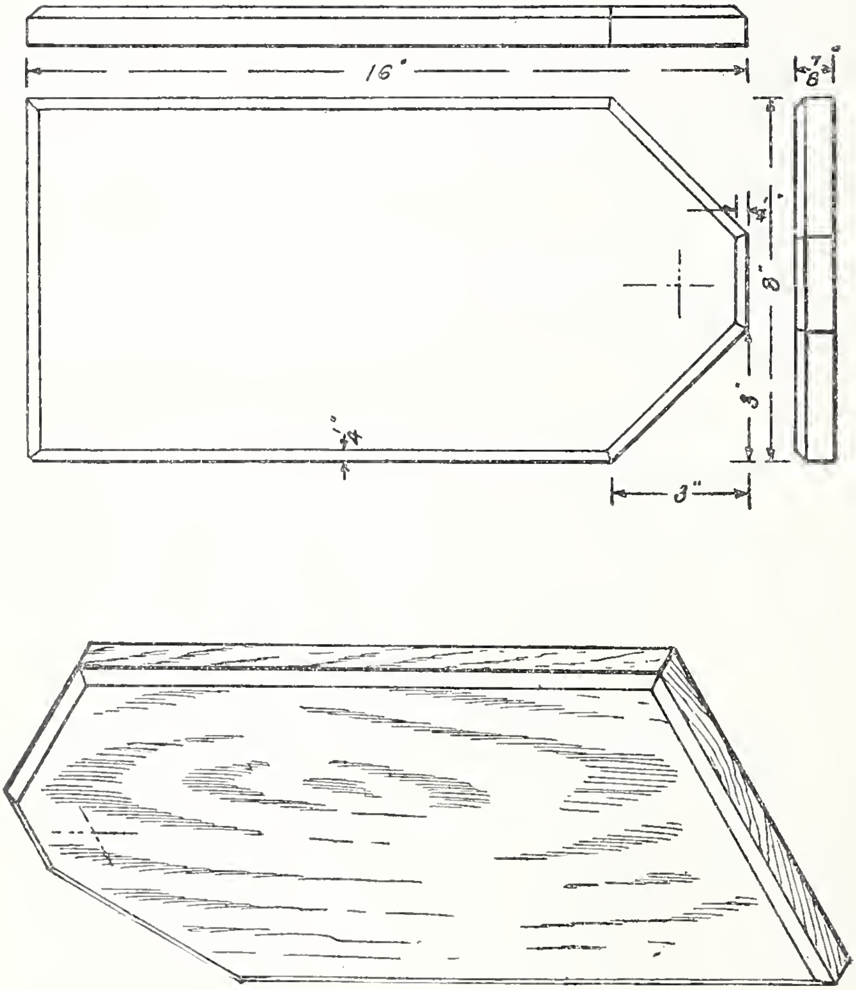


Fig. 1.—Bread Board.

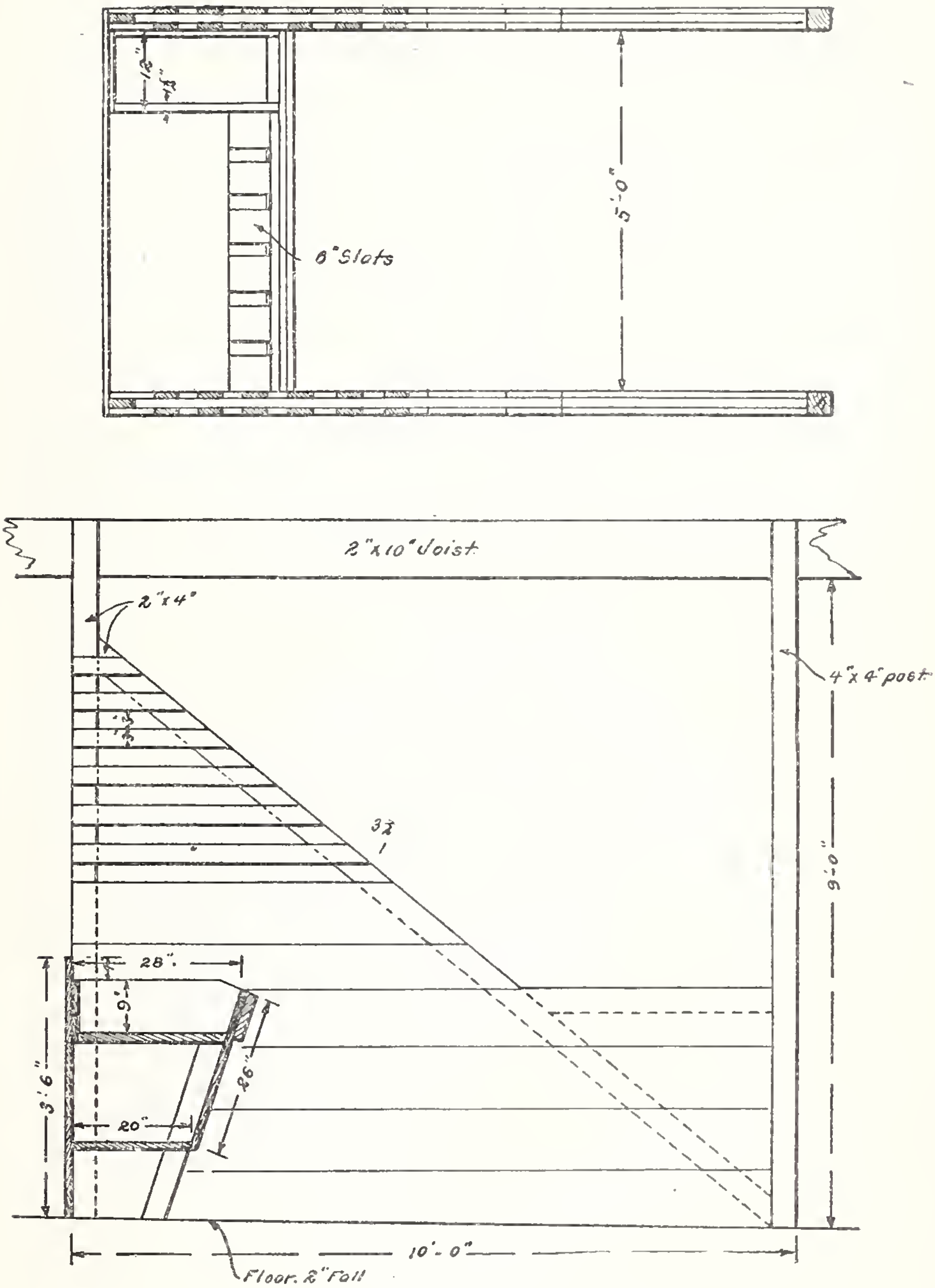


FIG. 2.—STALL, FEED BOX, AND MANGER.

BILL OF MATERIAL.

2 pieces yellow pine 4" x 4" x 10' 0".
2 pieces yellow pine 2" x 4" x 10' 0".
1 piece yellow pine 2" x 4" x 12' 0".
1 piece yellow pine 2" x 4" x 6' 6".
4½ pieces yellow pine 1" x 10" x 12' 0".
16 pieces yellow pine 1" x 10" x 10' 0".
1 piece yellow pine 1" x 6" x 12' 0".
1 piece yellow pine 2" x 12" x 10' 0".
3½ pieces yellow pine 1" x 9" x 12' 0".
1 piece yellow pine 2" x 8" x 5' 0".

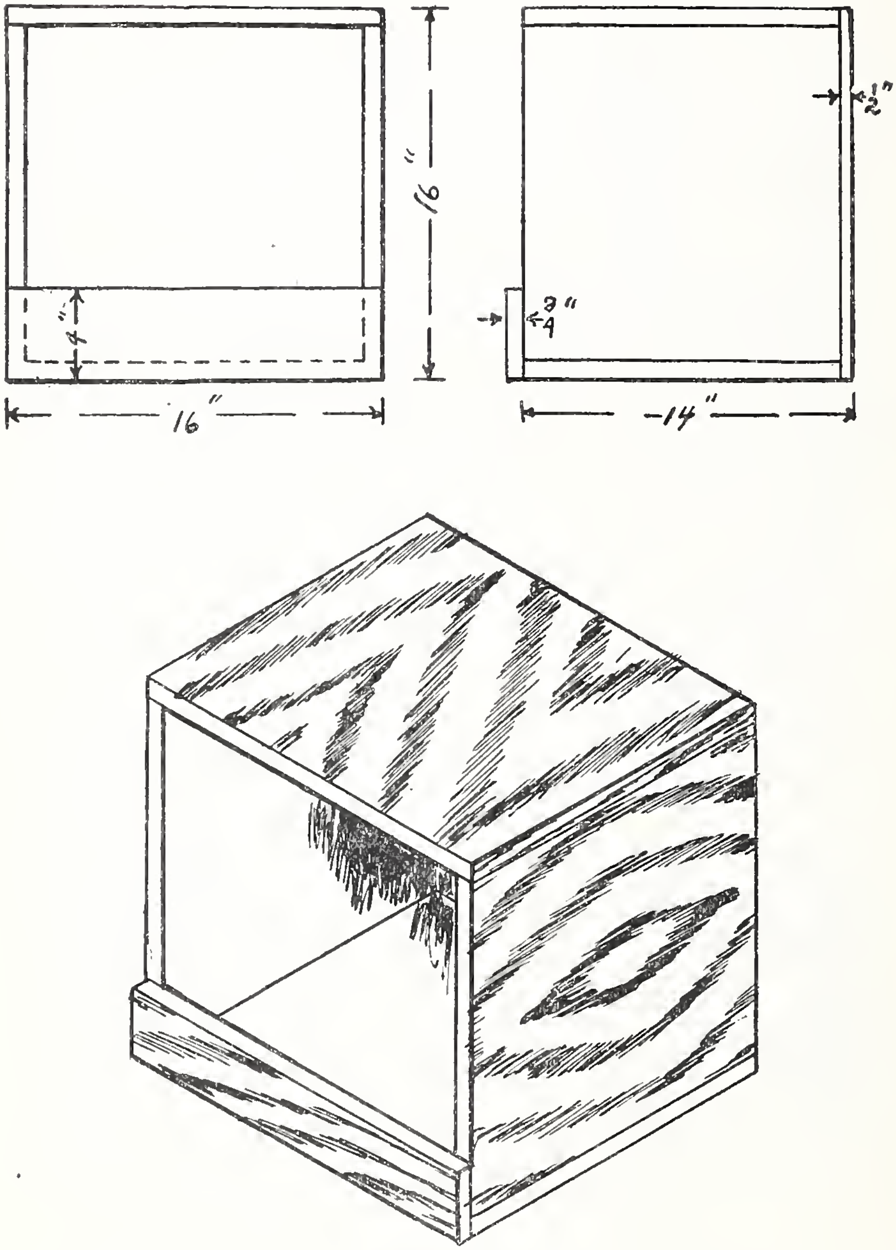


FIG. 3.—HEN'S NEST.

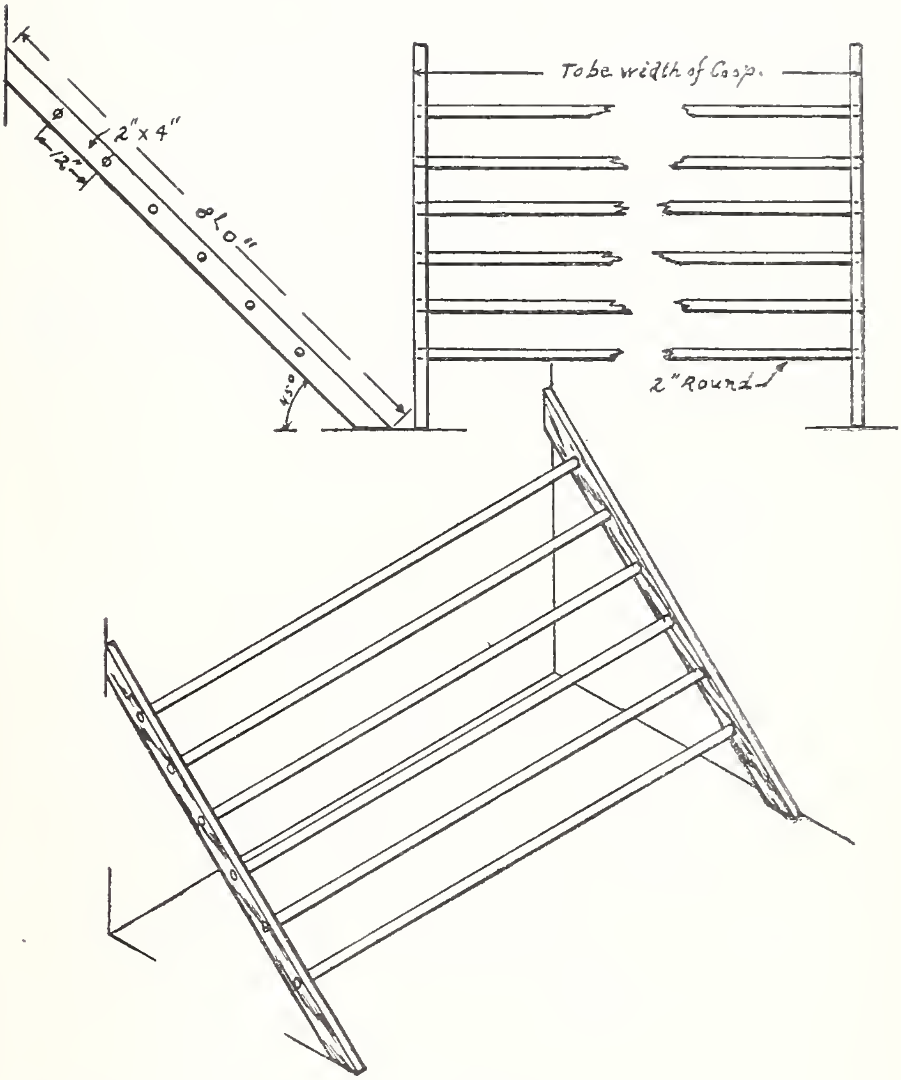


Fig. 4.—Henroost.

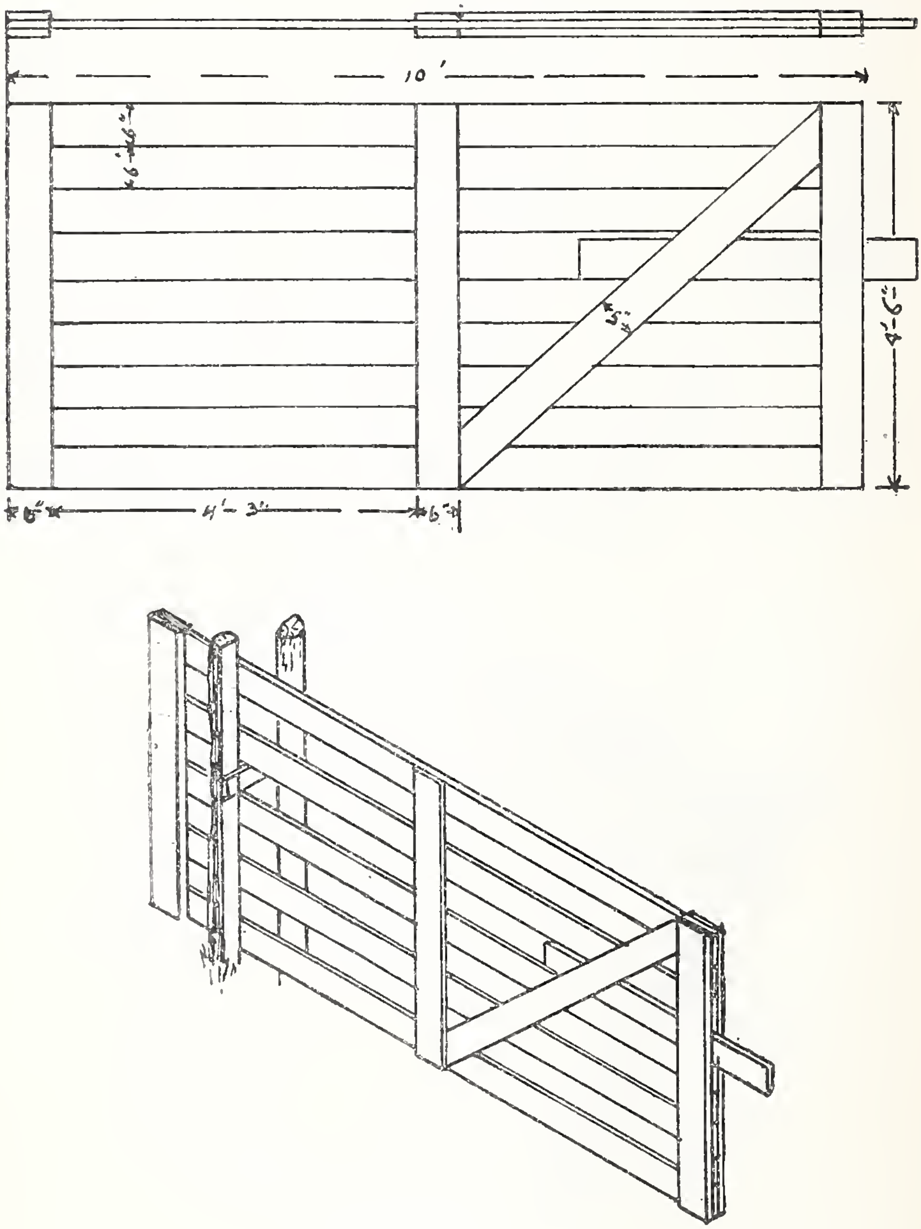


FIG. 5—GATE.

BILL OF MATERIAL.

5 pieces yellow pine 1" x 6" x 10' 0".
6 pieces yellow pine 1" x 6" x 4' 6".
2 pieces yellow pine 1" x 6" x 7' 0".

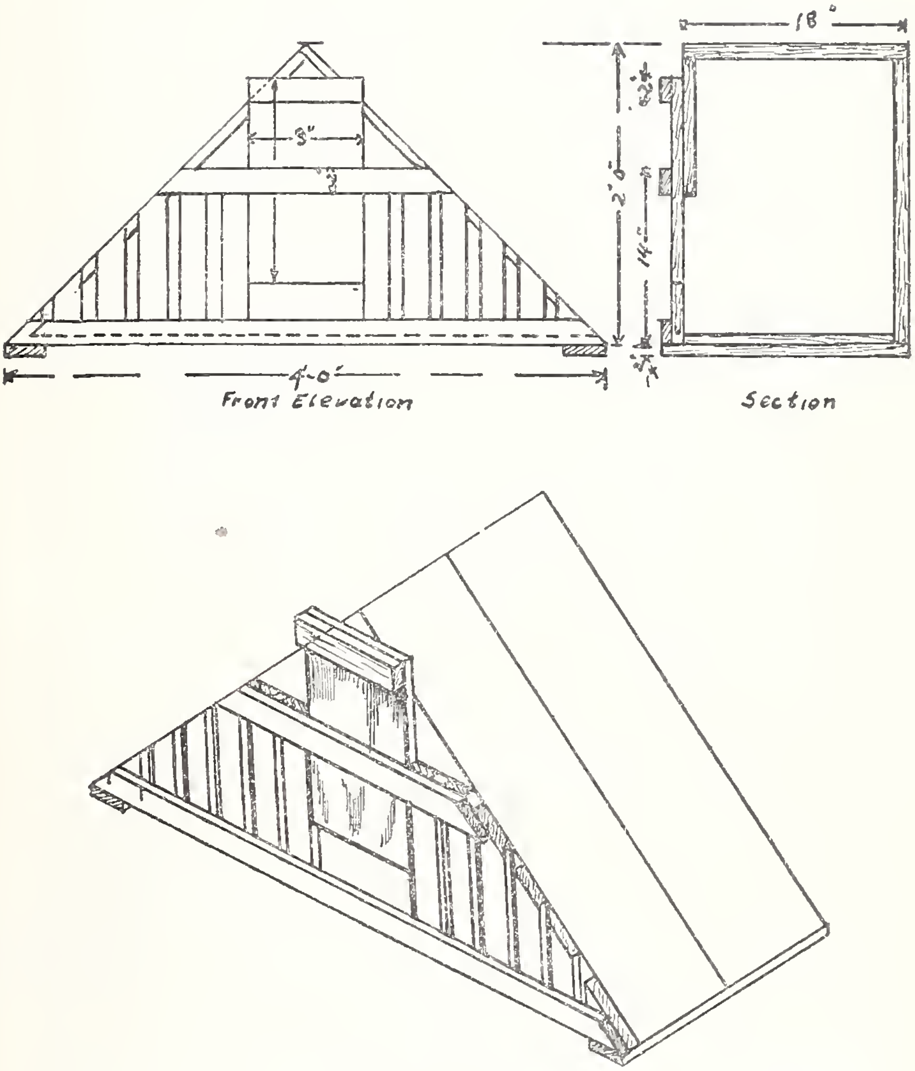


Fig. 6.—Chicken Coop.

BILL OF MATERIAL.

4 pieces yellow pine 1" x 10" x 3' 6"......	Top.
2 pieces yellow pine 1" x 10" x 4' 0"......	Bottom.
1 piece yellow pine 1" x 10" x 15"........	Door.
1 piece yellow pine 1" x 10" x 12' 0"......	Front and back.

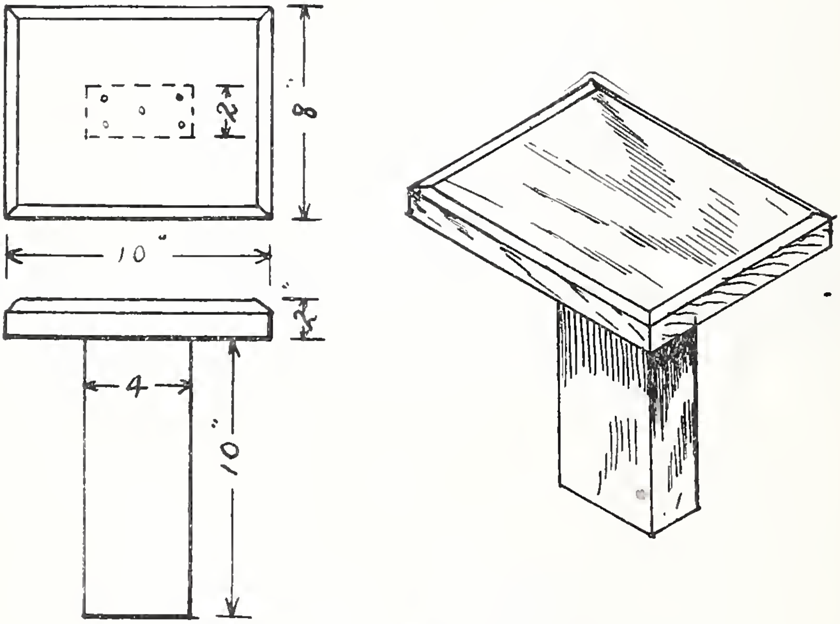


FIG. 7.—MILK STOOL.

BILL OF MATERIAL.

1 piece yellow pine 1½" x 8" x 10"......	Top.
1 piece yellow pine 2" x 4" x 10".......	Leg.

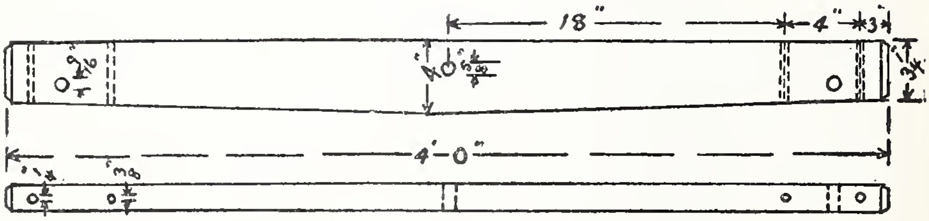


FIG 8.—EVENER.

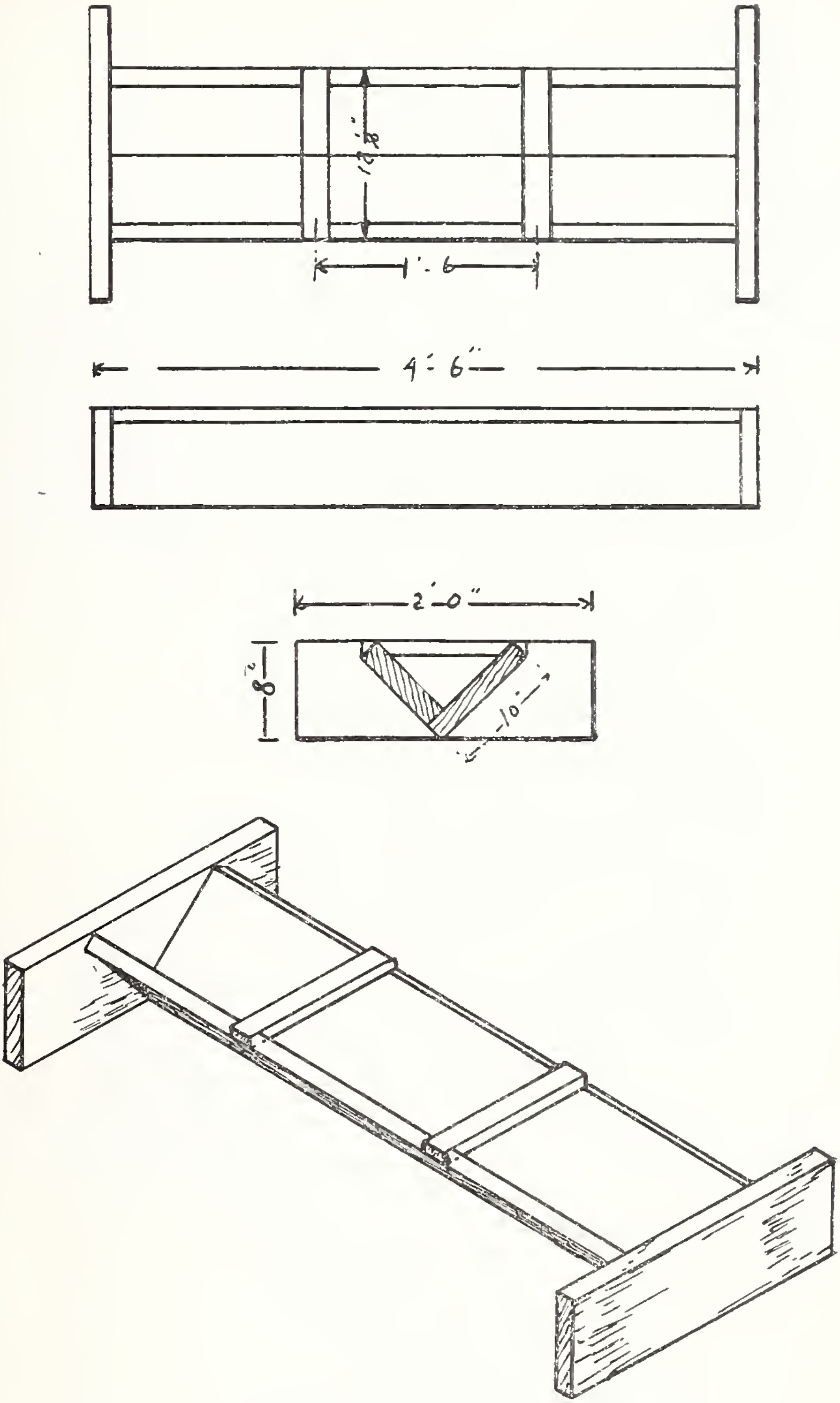


FIG. 9.—FEED TROUGH.

BILL OF MATERIAL.

2 pieces yellow pine 1½" x 10" x 4' 6".......	Sides.
2 pieces yellow pine 1½" x 8" x 2' 0".......	Ends.
2 pieces yellow pine 1" x 2" x 12"	Crosspieces.

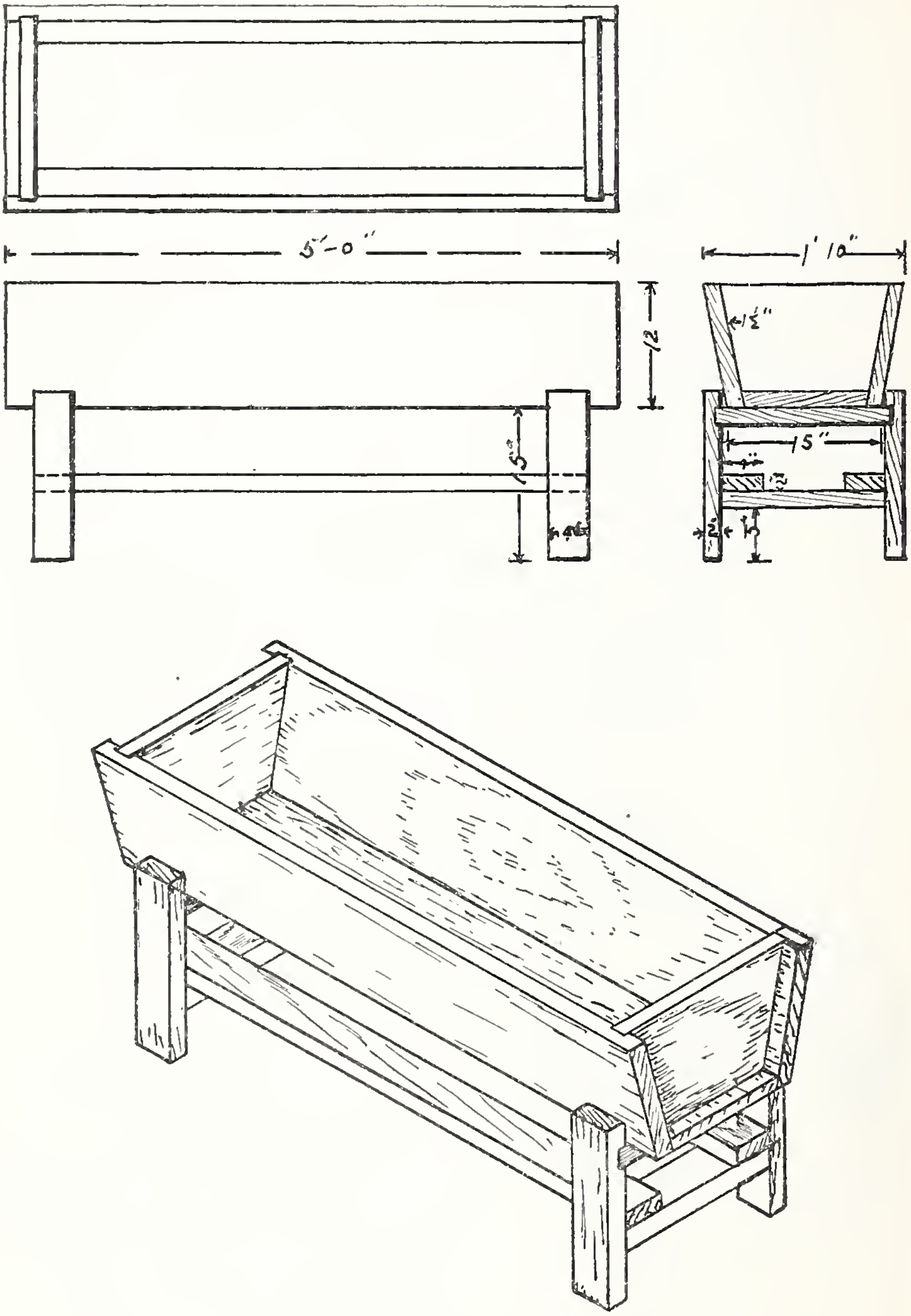


Fig. 10.—Water Trough.

BILL OF MATERIAL.

3 pieces yellow pine 1½" x 13" x 5' 0"......	Sides and bottom.
2 pieces yellow pine 1½" x 12" x 1' 10"	Ends.
2 pieces yellow pine 2" x 4" x 4' 6"........	Crosspieces.
6 pieces yellow pine 2" x 4" x 1' 6"........	Legs and braces.

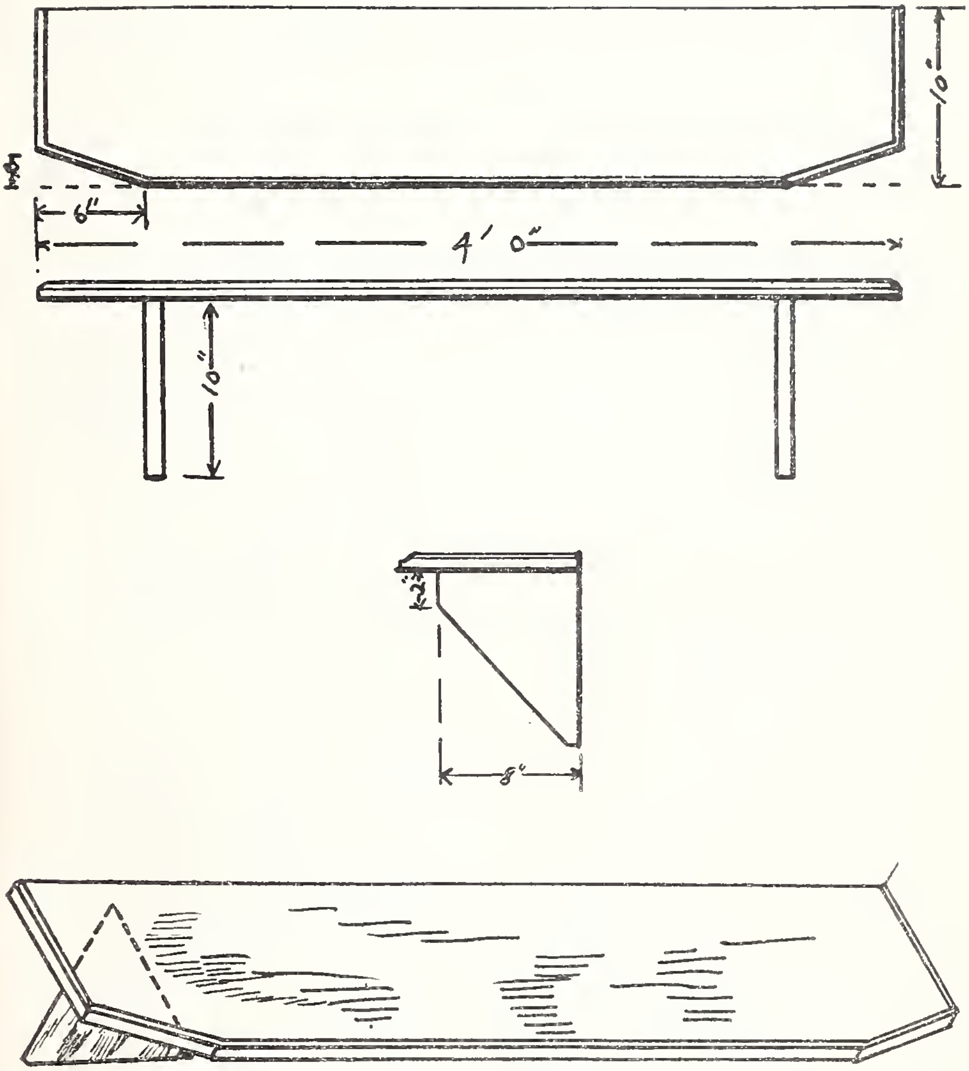


FIG. 11.—WALL SHELF.

BILL OF MATERIAL.

1 piece yellow pine 1" x 11" x 4' 2".
2 pieces yellow pine 1" x 9" x 11".

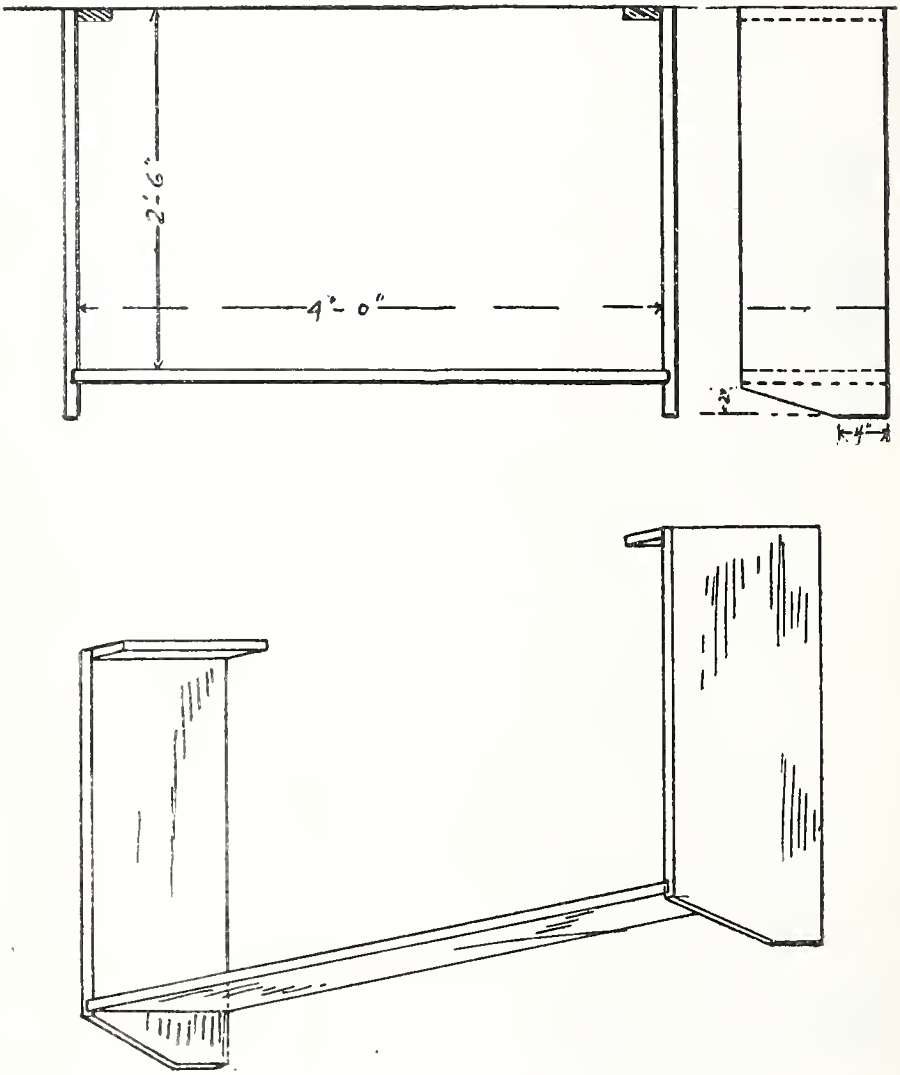


FIG. 12.—HANGING SHELF.

BILL OF MATERIAL.

1 piece yellow pine 1" x 12" x 4' 4".
2 pieces yellow pine 1" x 12" x 3' 0".
2 pieces yellow pine 1" x 3" x 12".

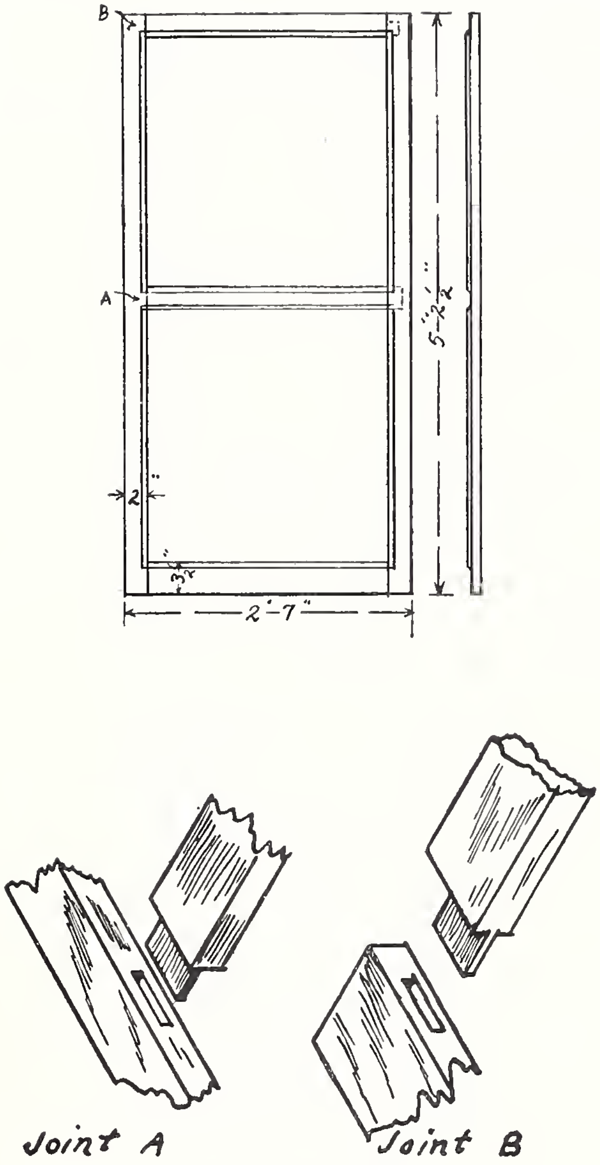


FIG. 21.—WINDOW SCREEN.

BILL OF MATERIAL.

2 pieces yellow pine 1⅛″ x 3″ x 5′ 4″......	Stiles.
2 pieces yellow pine 1⅛″ x 3″ x 2′ 7″......	Rails.
1 piece yellow pine 1⅛″ x 3″ x 2′ 7″	Lower rail.
30 feet screen binding ¼″ x ⅝″.	

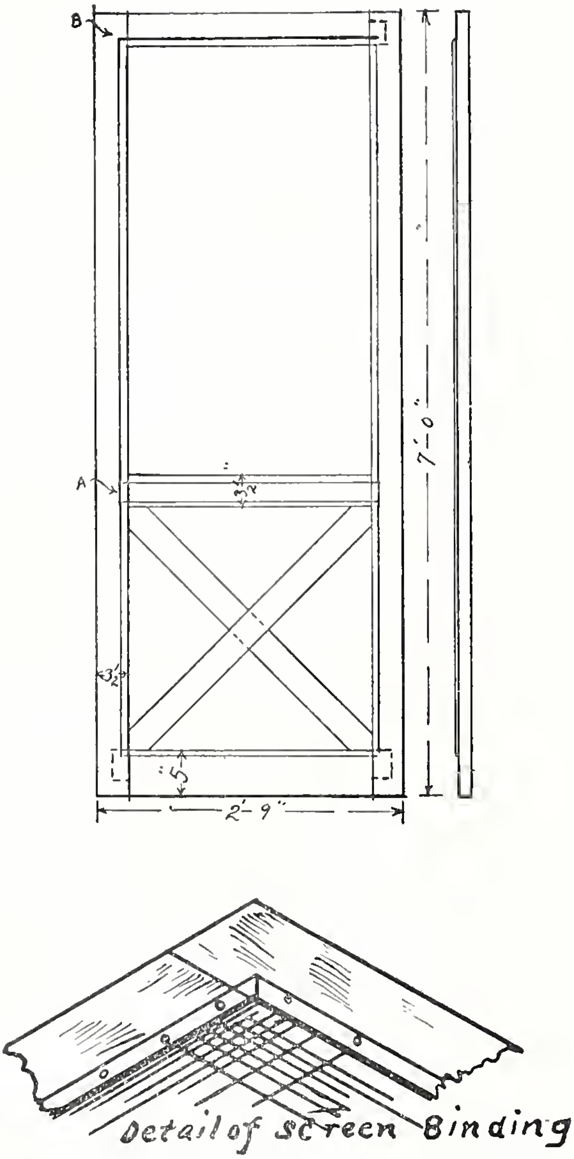


FIG. 22.—DOOR SCREEN.

BILL OF MATERIAL.

2 pieces yellow pine 1¼" x 4" x 7' 2"......	Stiles.
2 pieces yellow pine 1¼" x 4" x 2' 8"......	Rails.
1 piece yellow pine 1¼" x 5½" x 2' 1"......	Lower rail.
2 pieces yellow pine 1¼" x 4" x 3' 2"......	Braces.
24 feet screen binding ¼" x ⅝".	

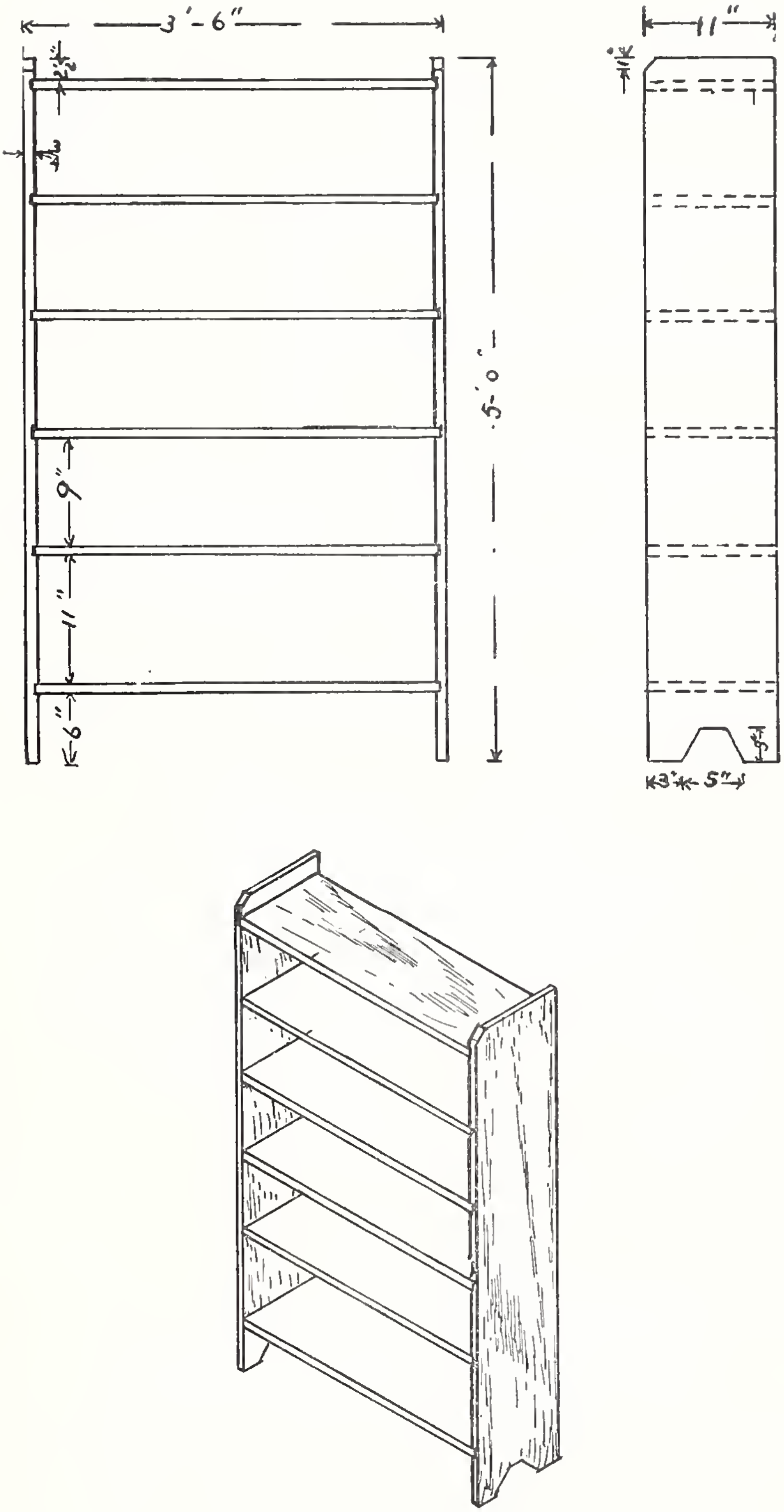


FIG. 23.—BOOKCASE.

BILL OF MATERIAL.

2 pieces yellow pine 1" x 12" x 5' 2"......	Sides.
6 pieces yellow pine 1" x 12" x 3' 6"......	Shelves.

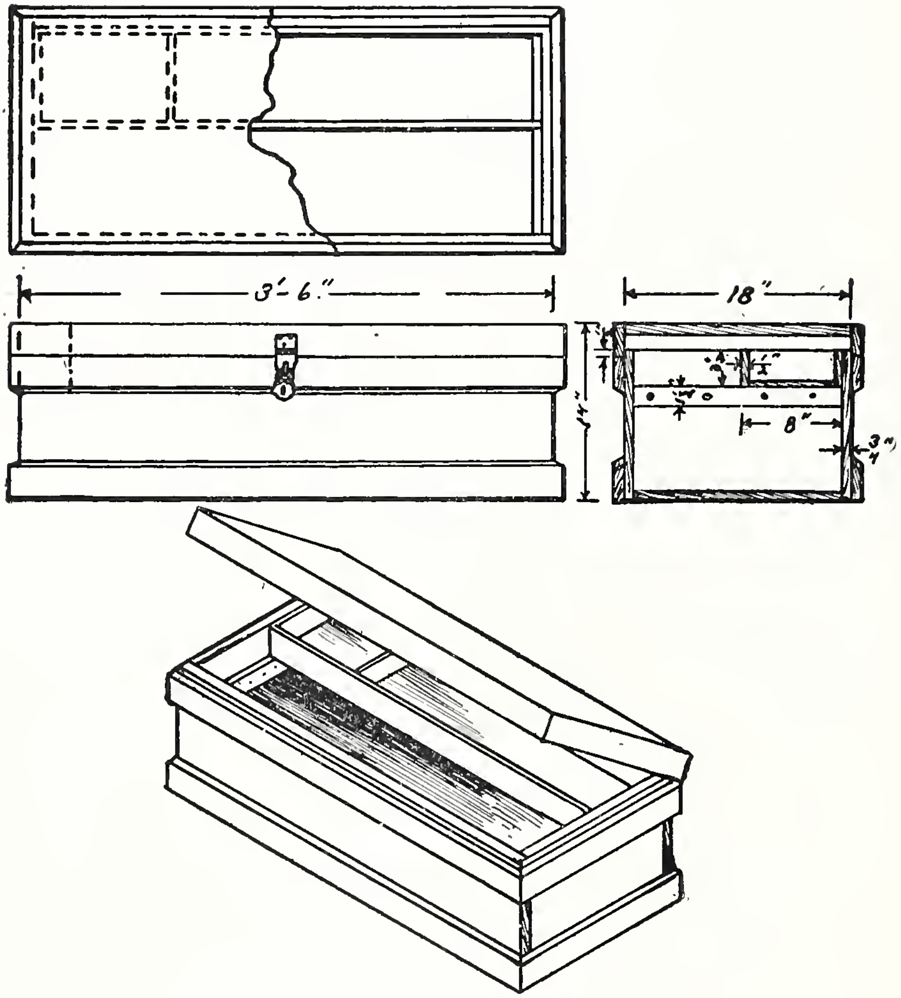


FIG. 24.—TOOL CHEST.

BILL OF MATERIAL.

4 pieces yellow pine 1" x 8" x 4' 8"......	Sides.
4 pieces yellow pine 1" x 8" x 1' 6"......	Ends.
4 pieces yellow pine 1" x 10" x 4' 8".....	Top and bottom.
6 pieces yellow pine 1" x 3½" x 4' 10"....	Base and top strips.
6 pieces yellow pine 1" x 3½" x 1' 10"....	Base and top strips.
1 piece poplar ½" x 9" x 7' 0"............	Tray.

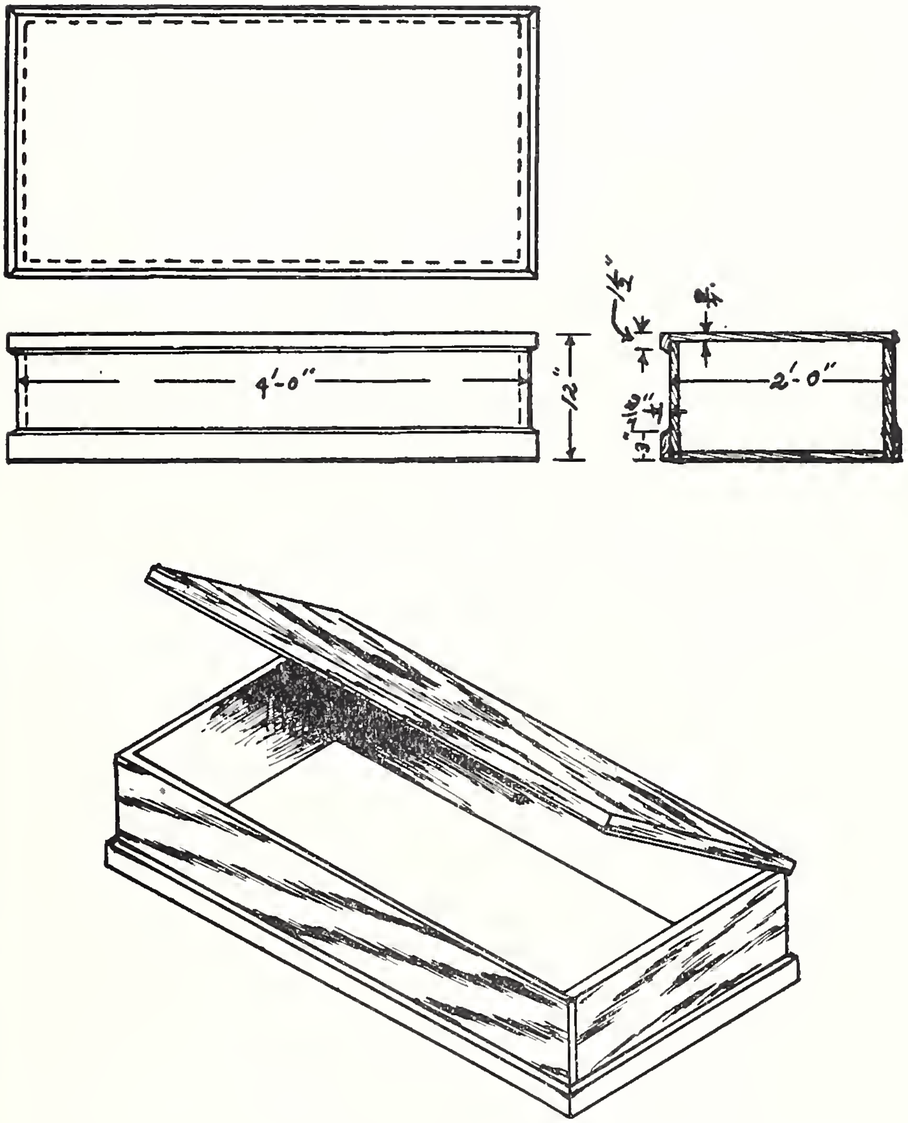
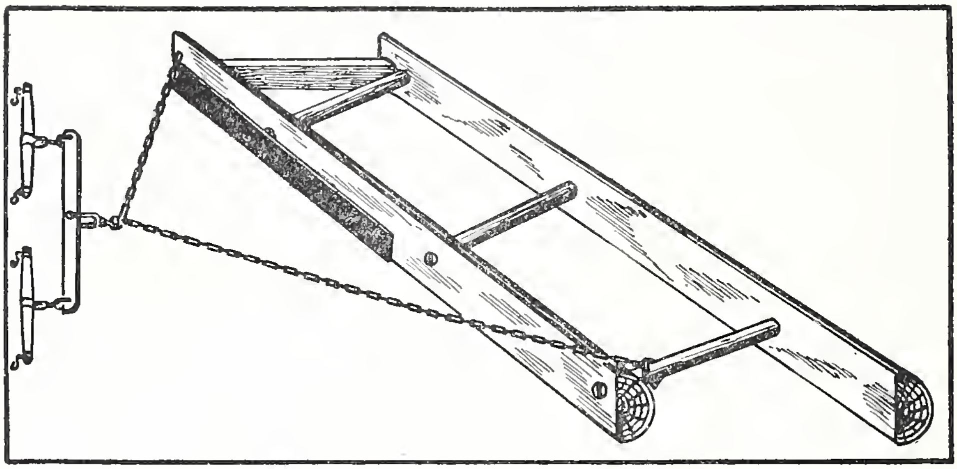


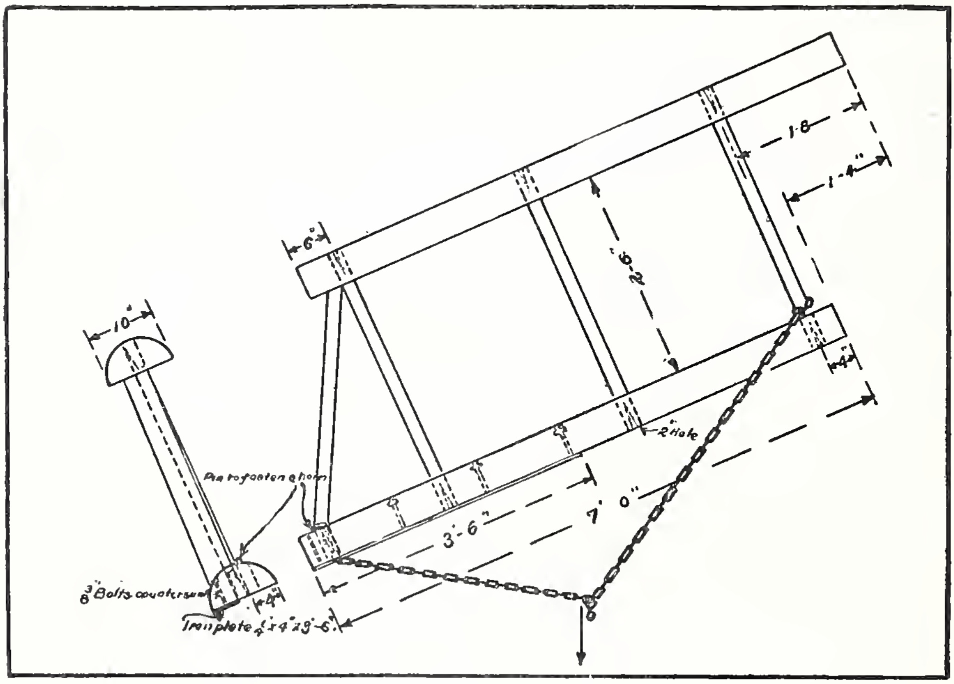
FIG. 25.—CLOTHES BOX.

BILL OF MATERIAL.

2 pieces yellow pine 1" x 12" x 4' 2"......	Sides.
2 pieces yellow pine 1" x 12" x 2' 0"......	Ends.
6 pieces yellow pine 1" x 9" x 4' 2".......	Top and bottom.
3 pieces yellow pine 1" x 3½" x 4' 4"......	Base.
2 pieces yellow pine 1" x 2" x 4' 4".......	Edge of top.



Perspective view.



Plan and elevation.

FIG. 26.—SPLIT-LOG DRAG.

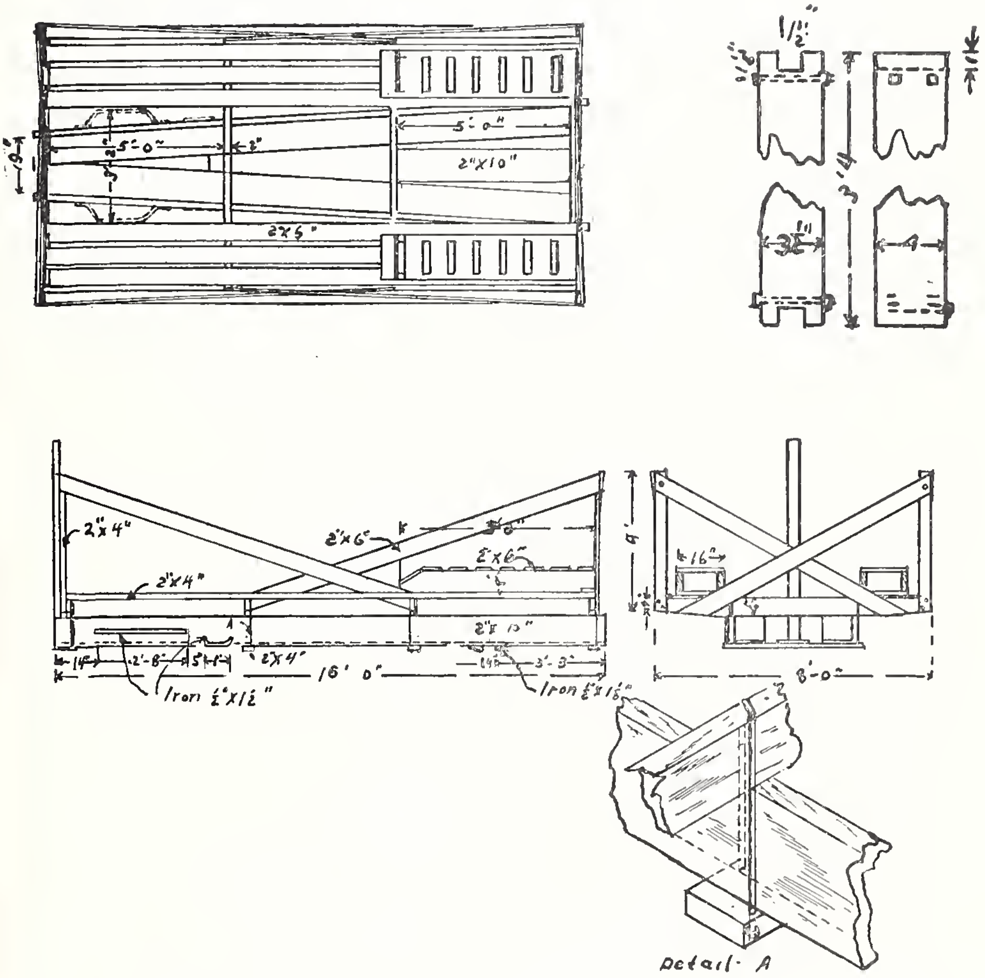


FIG. 27.—HAYRACK.

BILL OF MATERIAL.

2 pieces yellow pine 2" x 10" x 16' 0"
4 pieces yellow pine 2" x 6" x 8' 0".
4 pieces yellow pine 2" x 4" x 4' 2".
2 pieces yellow pine 2" x 4" x 15' 8".
4 pieces yellow pine 2" x 4" x 4' 0".
1 piece yellow pine 2" x 4" x 6' 2".
4 pieces yellow pine 2" x 4" x 1' 4".

4 pieces yellow pine 2" x 8" x 5' 8".
16 pieces yellow pine 1" x 6" x 1' 4".
4 pieces yellow pine 1" x 6" x 11' 0".
4 pieces yellow pine 1" x 6" x 9' 0".
6 pieces yellow pine 1" x 6" x 16' 0".
2 pieces yellow pine 1" x 10" x 16' 0".
1 piece yellow pine 1" x 10" x 11' 0".

HARDWARE.

6 bolts $\frac{3}{8}$" x 6".
16 bolts $\frac{3}{8}$" x 4".
8 clips, bolt $\frac{1}{2}$" x 19".

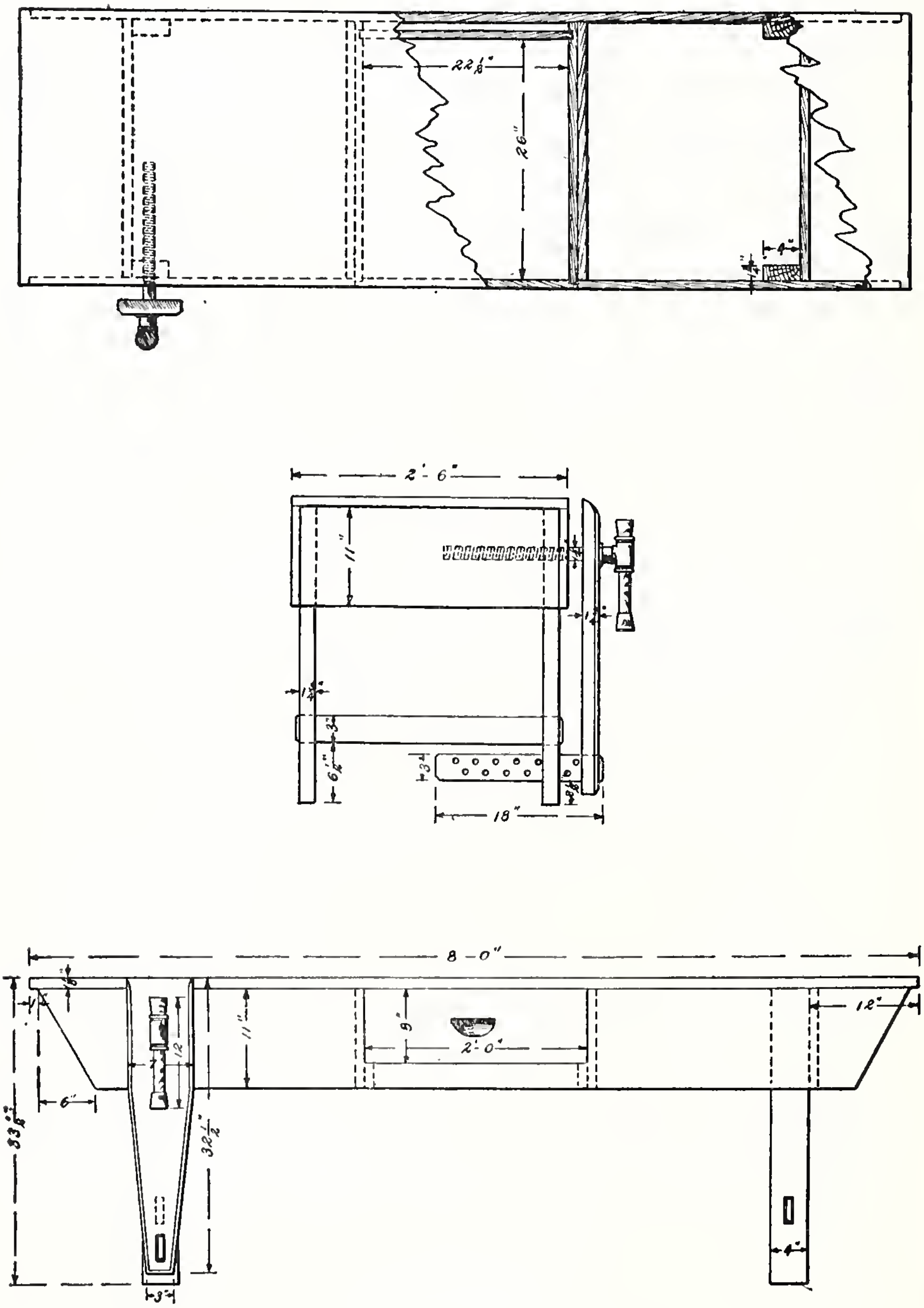


Fig. 28.—Details of a Cheap Workbench.

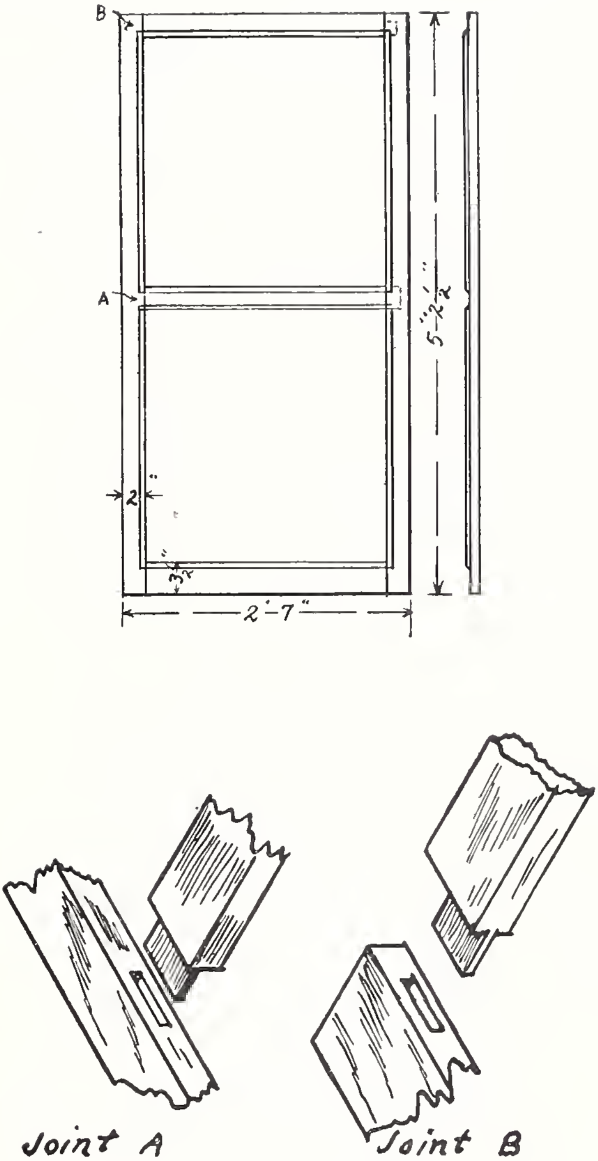
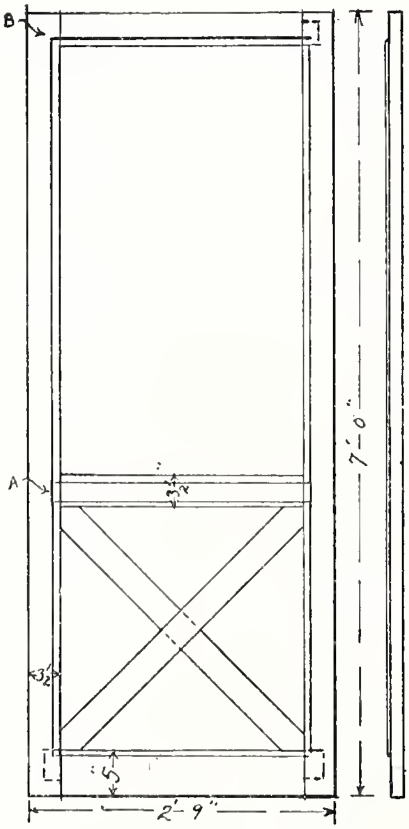


FIG. 21.—WINDOW SCREEN.

BILL OF MATERIAL.

2 pieces yellow pine 1⅛" x 3" x 5' 4"......	Stiles.
2 pieces yellow pine 1⅛" x 3" x 2' 7"......	Rails.
1 piece yellow pine 1⅛" x 3" x 2' 7"	Lower rail.
30 feet screen binding ¼" x ⅝".	



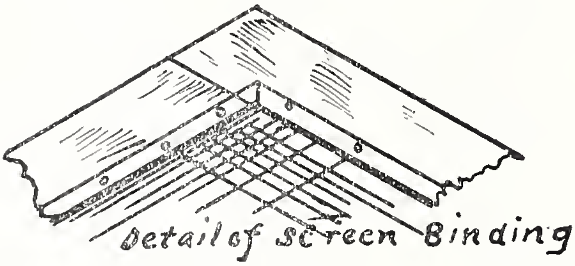


FIG. 22.—DOOR SCREEN.

BILL OF MATERIAL.

2 pieces yellow pine 1¼" x 4" x 7' 2"......	Stiles.
2 pieces yellow pine 1¼" x 4" x 2' 8"......	Rails.
1 piece yellow pine 1¼" x 5½" x 2' 1"......	Lower rail.
2 pieces yellow pine 1¼" x 4" x 3' 2"......	Braces.
24 feet screen binding ¼" x ⅝".	

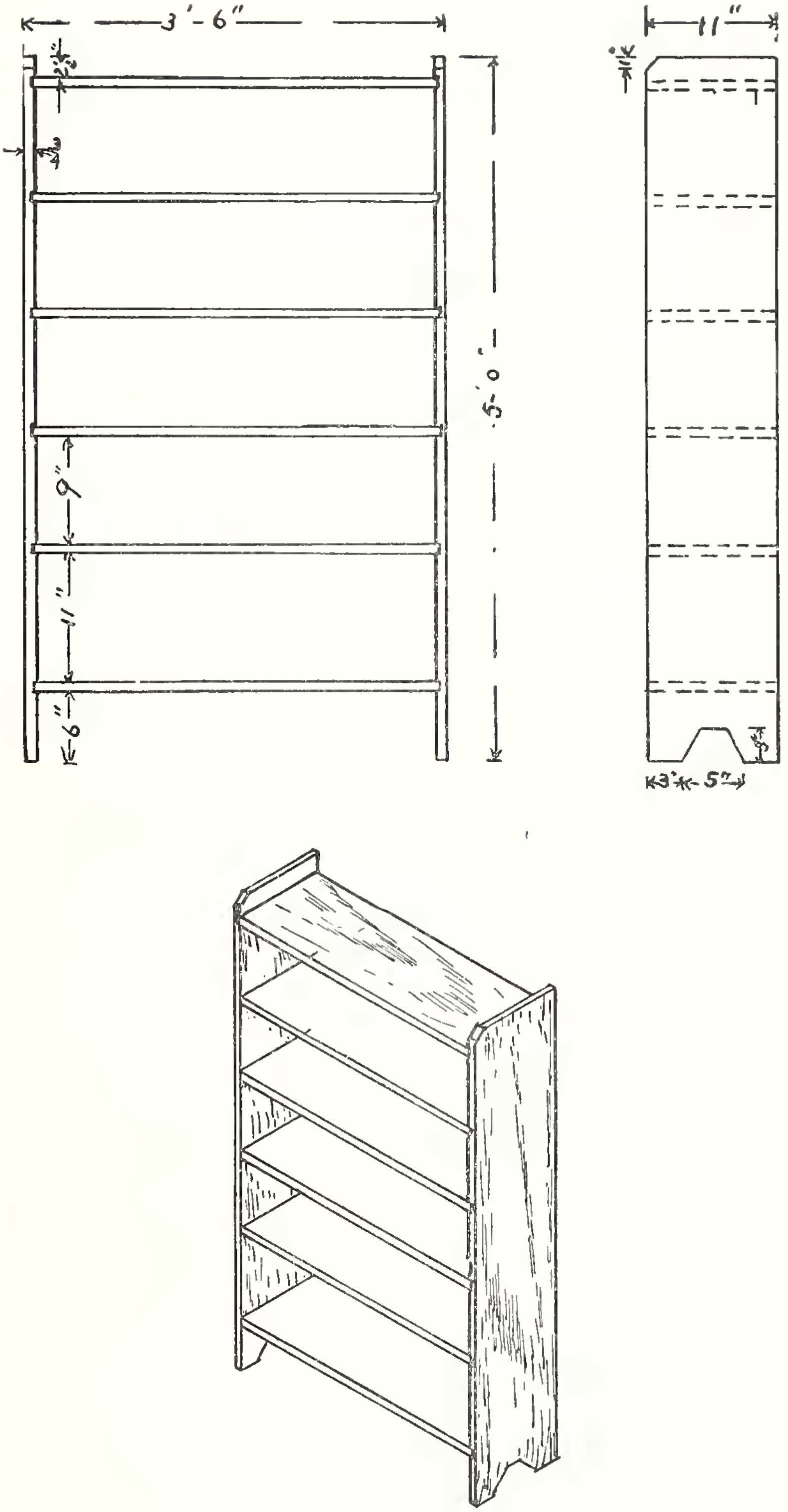


Fig. 23.—Bookcase.

BILL OF MATERIAL.

2 pieces yellow pine 1" x 12" x 5' 2"......	Sides.
6 pieces yellow pine 1" x 12" x 3' 6"......	Shelves.

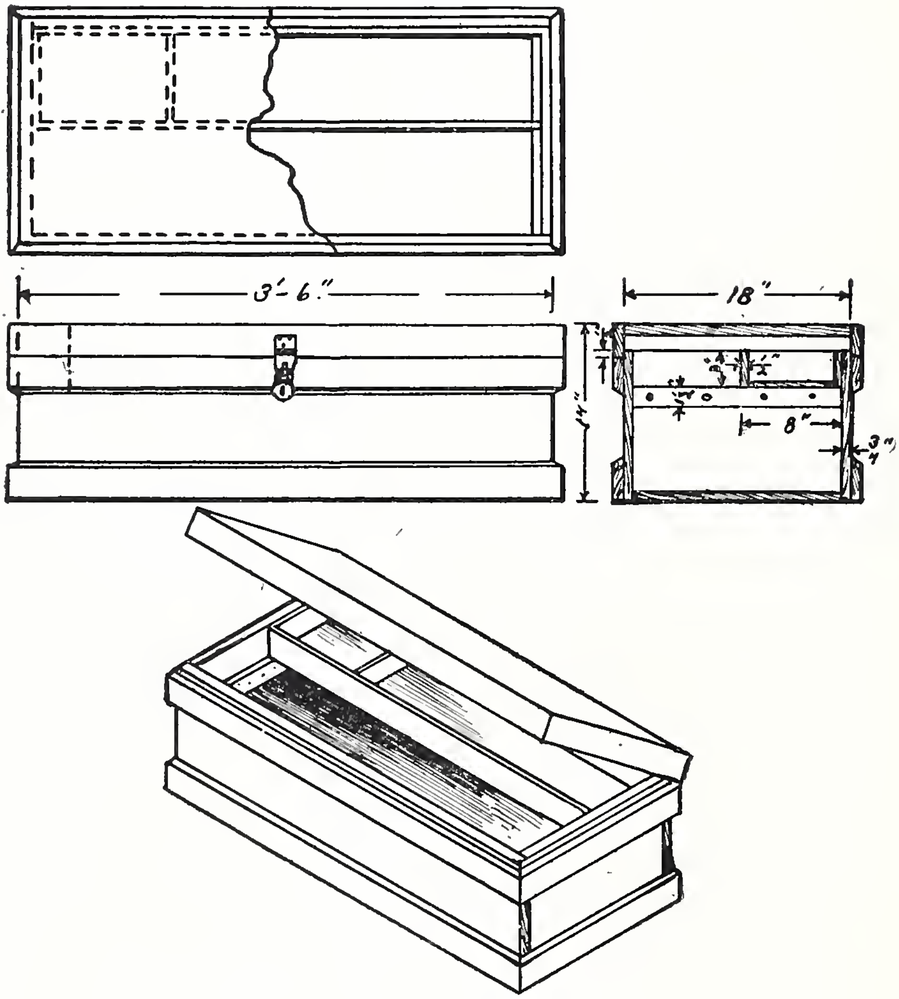


Fig. 24.—Tool Chest.

BILL OF MATERIAL.

4 pieces yellow pine 1" x 8" x 4' 8"	Sides.
4 pieces yellow pine 1" x 8" x 1' 6"	Ends.
4 pieces yellow pine 1" x 10" x 4' 8"	Top and bottom.
6 pieces yellow pine 1" x 3½" x 4' 10"	Base and top strips.
6 pieces yellow pine 1" x 3½" x 1' 10"	Base and top strips.
1 piece poplar ½" x 9" x 7' 0"	Tray.

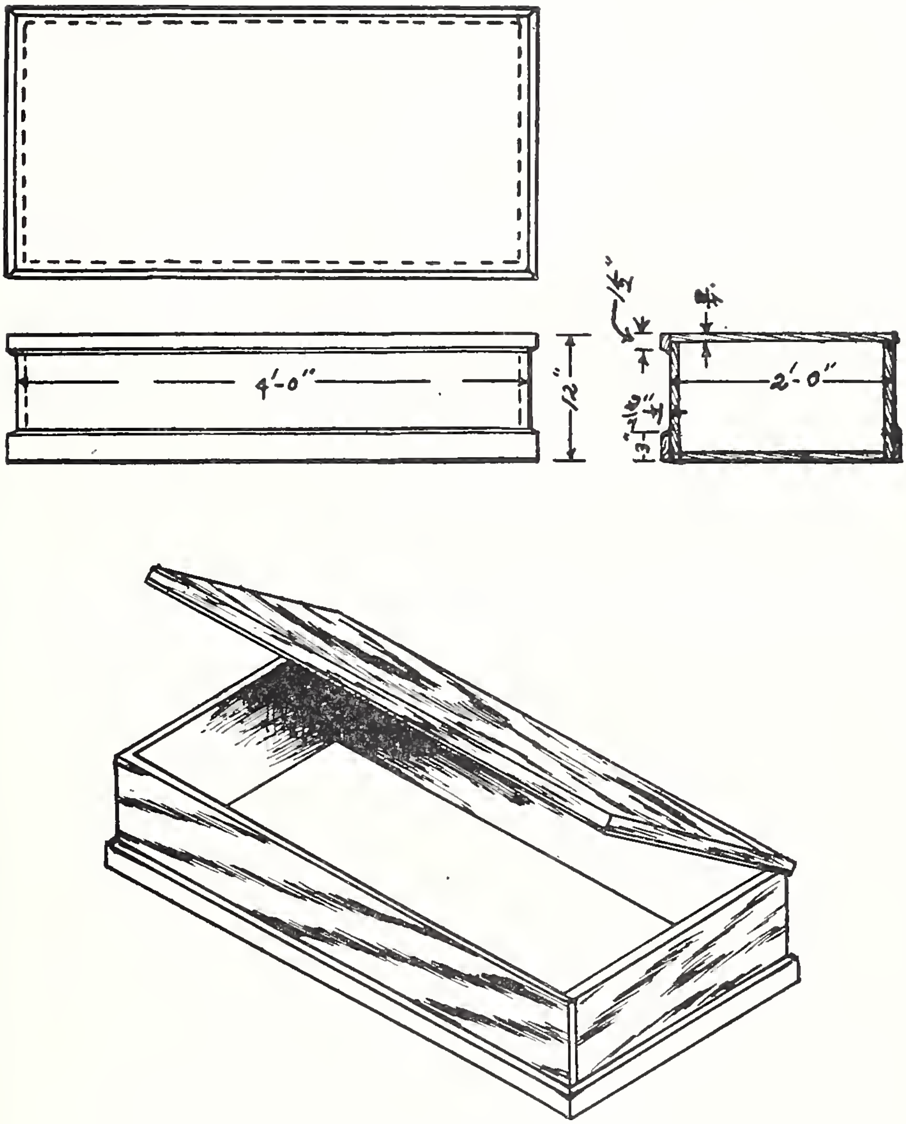
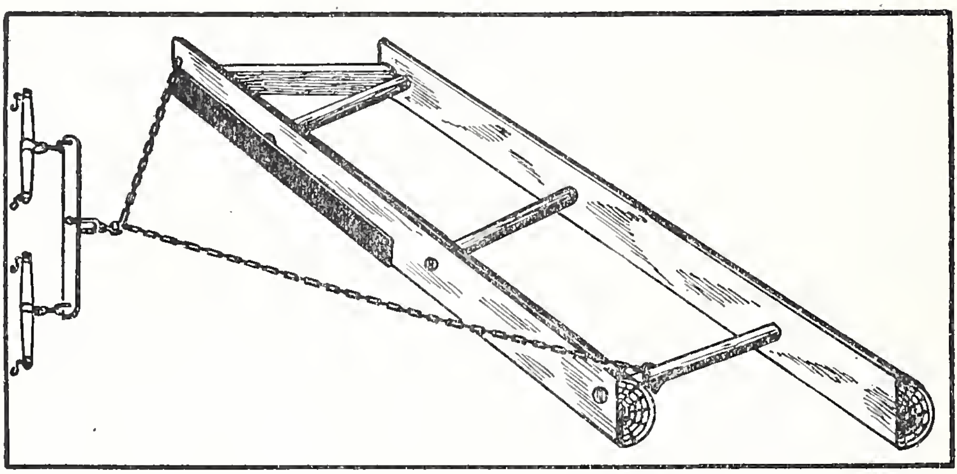


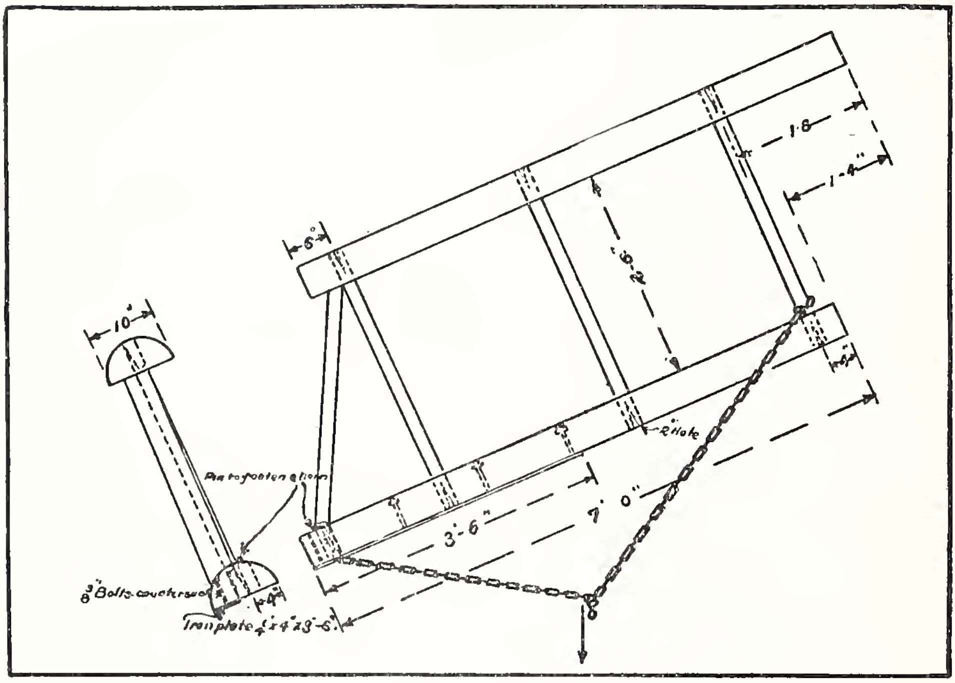
FIG. 25.—CLOTHES BOX.

BILL OF MATERIAL.

2 pieces yellow pine 1" x 12" x 4' 2"	Sides.
2 pieces yellow pine 1" x 12" x 2' 0"	Ends.
6 pieces yellow pine 1" x 9" x 4' 2"	Top and bottom.
3 pieces yellow pine 1" x 3½" x 4' 4"	Base.
2 pieces yellow pine 1" x 2" x 4' 4"	Edge of top.



Perspective view.



Plan and elevation.

FIG. 26.—SPLIT-LOG DRAG.

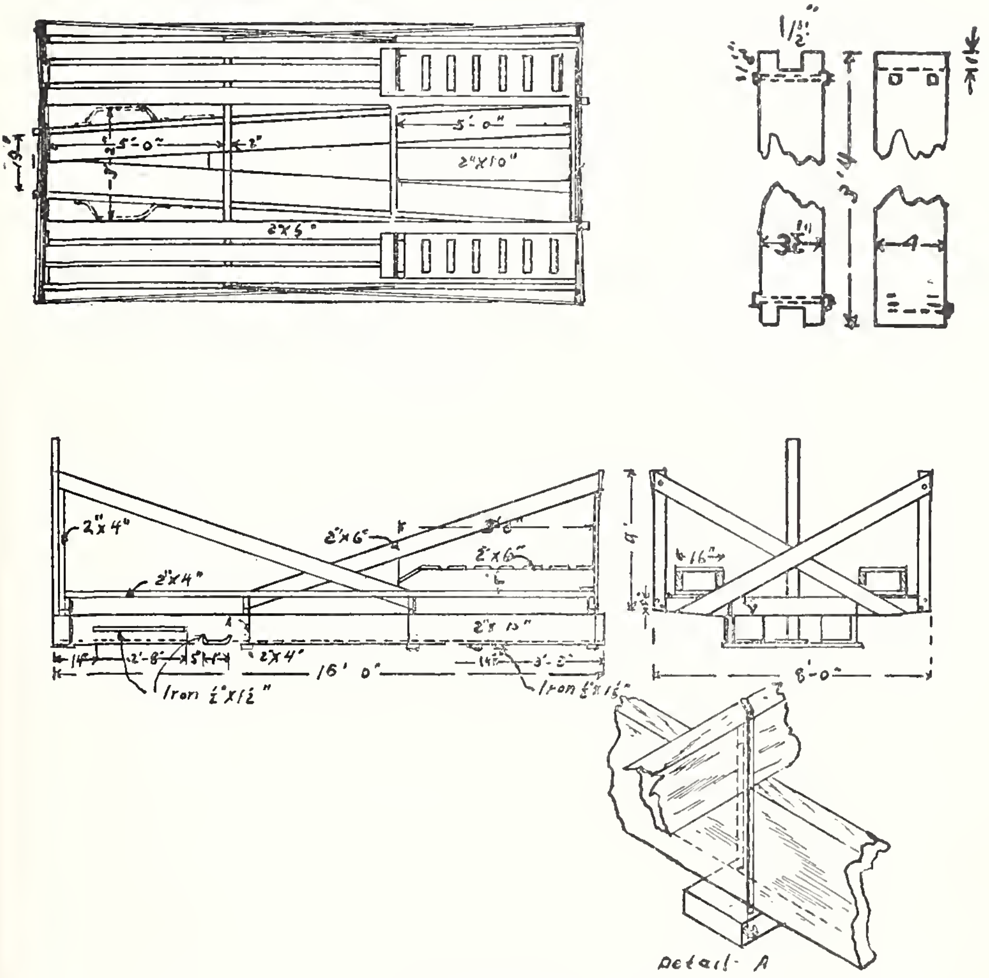


FIG. 27.—HAYRACK.

BILL OF MATERIAL.

2 pieces yellow pine 2" x 10" x 16' 0"
4 pieces yellow pine 2" x 6" x 8' 0".
4 pieces yellow pine 2" x 4" x 4' 2".
2 pieces yellow pine 2" x 4" x 15' 8".
4 pieces yellow pine 2" x 4" x 4' 0".
1 piece yellow pine 2" x 4" x 6' 2".
4 pieces yellow pine 2" x 4" x 1' 4".
4 pieces yellow pine 2" x 8" x 5' 8".
16 pieces yellow pine 1" x 6" x 1' 4".
4 pieces yellow pine 1" x 6" x 11' 0".
4 pieces yellow pine 1" x 6" x 9' 0".
6 pieces yellow pine 1" x 6" x 16' 0".
2 pieces yellow pine 1" x 10" x 16' 0".
1 piece yellow pine 1" x 10" x 11' 0".

HARDWARE.

6 bolts ⅜" x 6".
16 bolts ⅜" x 4".
8 clips, bolt ½" x 19".

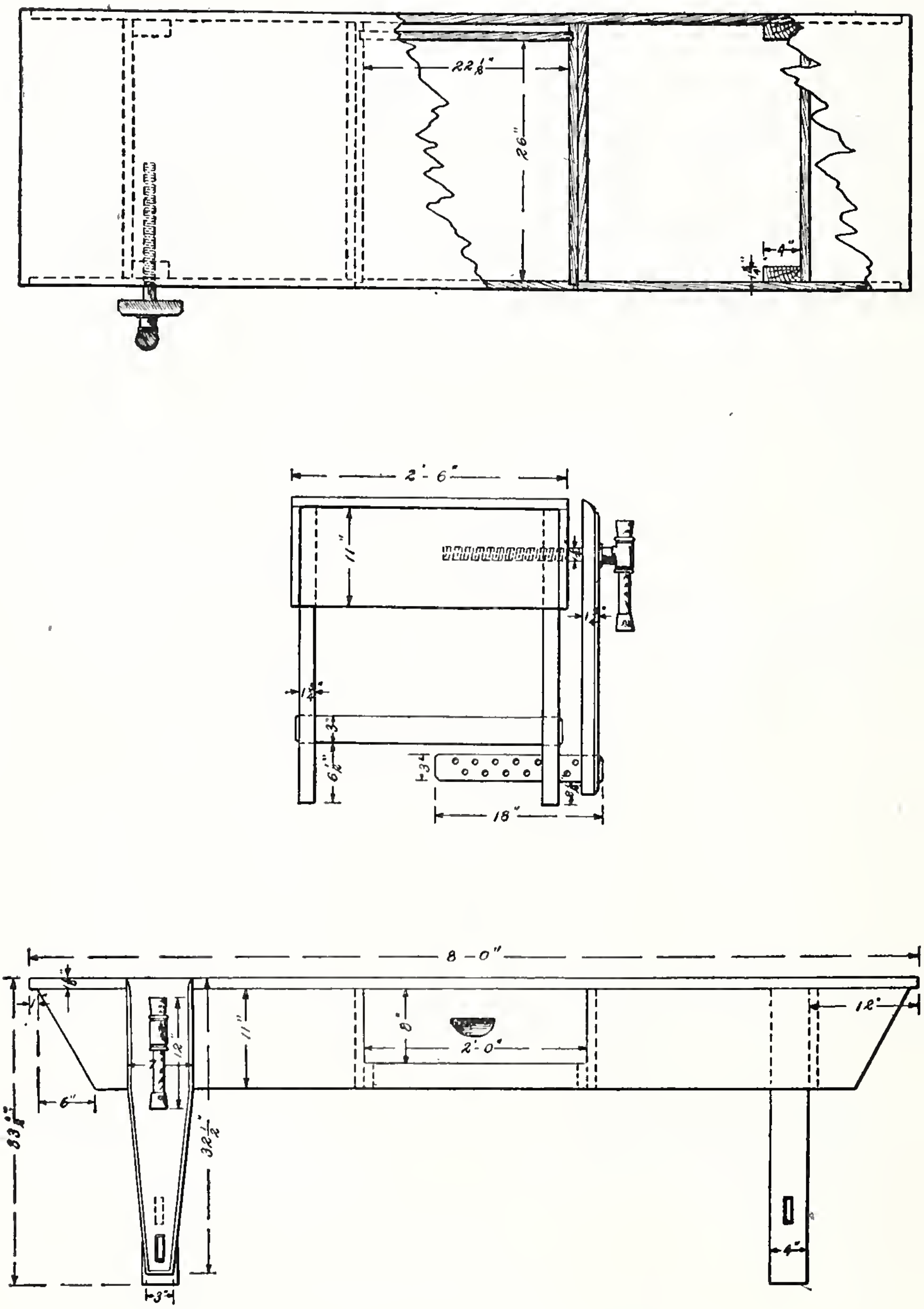
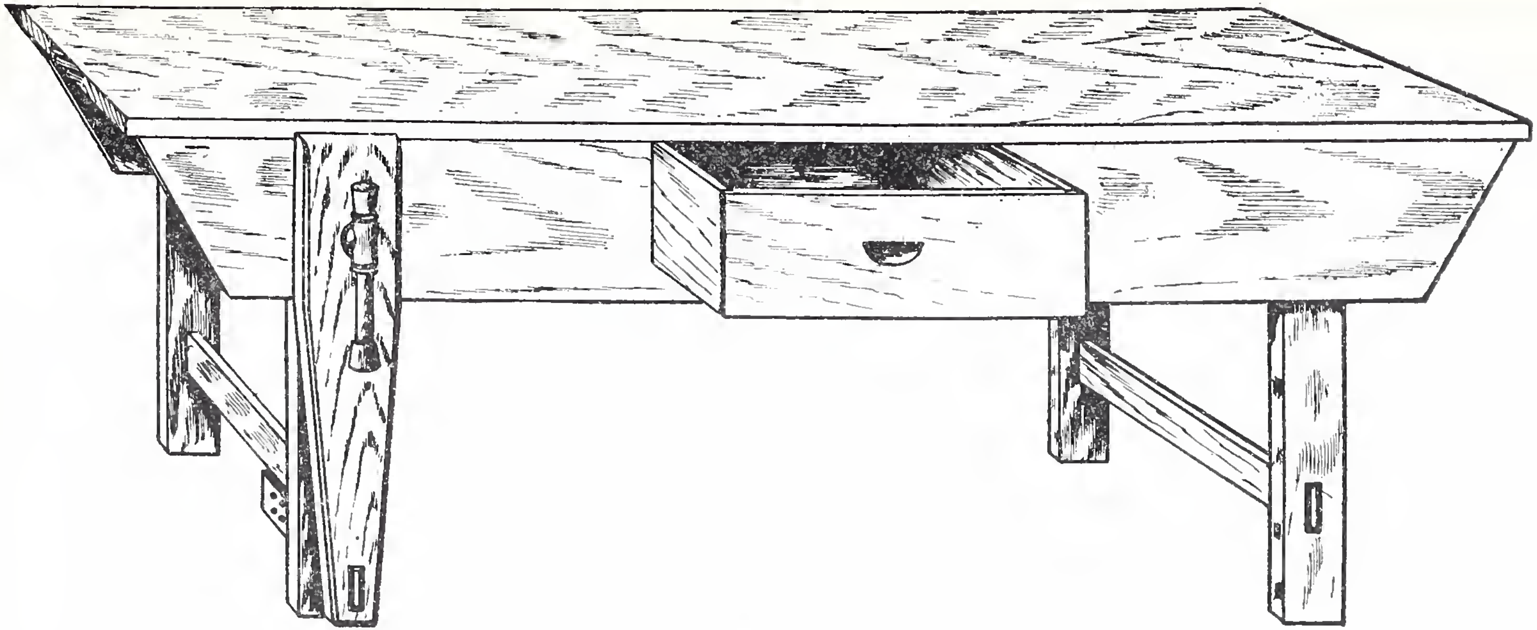


Fig. 28.—Details of a Cheap Workbench.

O



CHEAP WORKBENCH.

BILL OF MATERIAL.

3 pieces 1⅛″ x 12″ x 8′ 0″	Top.
2 pieces 1″ x 12″ x 8′ 0″	Sides.
4 pieces 1″ x 12″ x 2′ 6″	End and center crosspieces.
2 pieces 1″ x 3½″ x 2′ 6″	Cross rails.
1 piece 1″ x 3½″ x 1′ 8″	Vise piece.
4 pieces 2″ x 4″ x 2′ 9″	Legs.
2 pieces 1″ x 8″ x 2′ 6″	Drawer sides.
1 piece 1″ x 8″ x 2′ 0″	Drawer ends.
3 pieces ½″ x 9″ x 2′ 6″	Poplar panel, drawer bottom.
1 piece 2″ x 8″ x 2′ 9″	Vise block, oak.

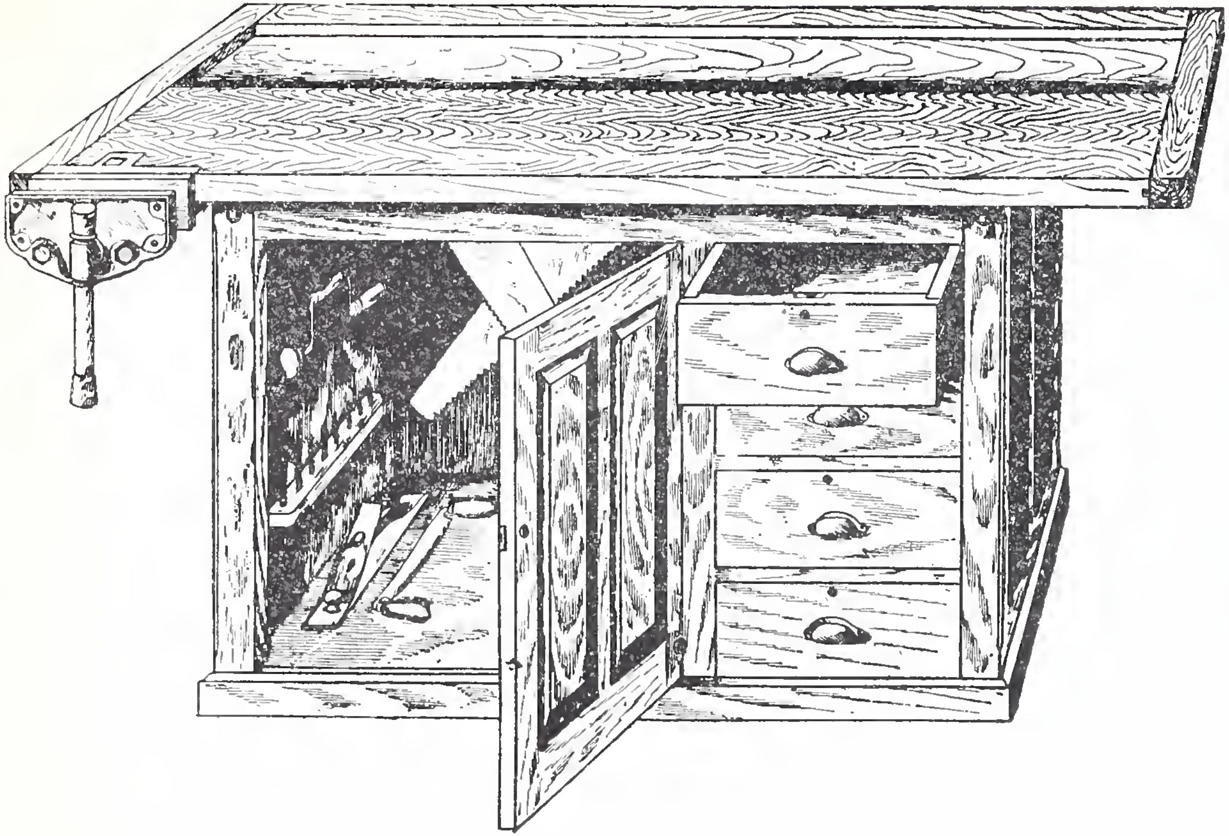
Use offal for drawer slides, etc.

HARDWARE.

1 vise screw, 1¼″.
2 pounds nails, 8-d., common.
2 pounds nails, 8-d., casing.

RECAPITULATION.

30 feet lumber, 1⅛″ x 12″ x 8′, "B" yellow pine finish, at $45 per M	$1.35
34 feet lumber, 1″ x 12″ x 8′, "B" yellow pine finish, at $45 per M	1.53
8 feet lumber, 2″ x 4″ x 12′, "B" yellow pine, common, at $27 per M	.22
4 feet lumber, 2″ x 8″ x 3′, "B" oak, at $50 per M	.20
6 feet lumber, ½″ x 9″, poplar panel, at $70	.42
Cost of lumber	3.72
HARDWARE.	
1 vise screw, 1¼	.60
2 pounds nails, 8-d., common, at $0.03½	.07
2 pounds nails, 8-d., casing, at $0.03½	.07
Cost of hardware	.74
Carpenter labor to be done by students.	
½ gallon ready-mixed paint, at $1.60 per gallon	.80
Cost of lumber	3.72
Total cost	5.26



MANUAL TRAINING WORKBENCH.

BILL OF MATERIAL.

1 **bench top**, as per drawing, or	
3 pieces, 2" x 10" x 6′ 0", "A" yellow pine finish.	
4 pieces, 3" x 2" x 2′ 10", "A" yellow pine finish..	Corner post.
4 pieces, 3" x 3" x 2′ 0", "A" yellow pine finish...	End rails.
4 pieces, 3" x 3" x 4′ 0", "A" yellow pine finish...	Side rails.
2 pieces, 1" x 3" x 4′ 3", "A" yellow pine finish...	Side base.
2 pieces, 1" x 3" x 2′ 2", "A" yellow pine finish...	End base.
3 pieces, 1" x 10" x 4′ 0", "A" yellow pine finish..	Bottom.
3 pieces, 1" x 10" x 2′ 8", "A" yellow pine finish..	Partition.
6 pieces, 1⅛" x 2" x 2′ 6", "A" yellow pine finish..	Stiles and muntins for back and ends.
8 pieces, 1" x 10" x 2′ 6", "A" yellow pine finish..	Panels, back and ends.
2 pieces, 1⅛" x 2½" x 2′ 4", "A" yellow pine finish..	Door stiles.
1 piece, 1⅛" x 2" x 2′ 0", "A" yellow pine finish...	Muntins.
2 pieces, 1⅛" x 3" x 2′ 2", "A" yellow pine finish ..	Rails.
2 pieces, 1" x 12" x 2′ 0", "A" yellow pine finish ..	Panels.
1 piece, 1⅛" x 2" x 2′ 4", "A" yellow pine finish...	Hanging stile.
4 pieces, 1⅛" x 6" x 1′ 3", "A" yellow pine finish ..	Drawer fronts.
8 pieces, ½" x 6" x 2′ 0", poplar panel	Drawer sides.
4 pieces, ½", x 6" x 1′ 3", poplar panel	Drawer ends.
4 drawer bottoms, ½", poplar panel 12 square feet.	
Use offal for drawer slides, etc.	

HARDWARE.

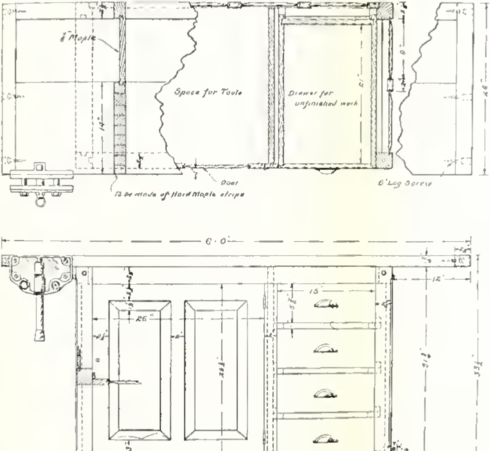
1 pair hinges, tight pin butts.
5 locks, drawer.
16 ½" x 6" lag screws.

RECAPITULATION.

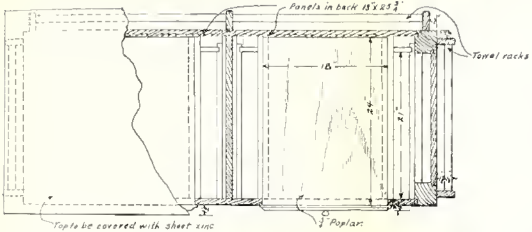
27 feet lumber, 3" x 3" x 12′, "A" yellow pine finish, at $50 per M..	$1.35
40 feet lumber, 1" x 10" x 16′, "A" yellow pine finish, at $50 per M..	2.00
12 feet lumber, 1" x 12" x 12′, "A" yellow pine finish, at $50 per M..	.60
18 feet lumber, 1⅛" x 12" x 16′, "A" yellow pine finish, at $50 per M.	.90
30 feet lumber, 2" x 10" x 6′ or 12′, "A" yellow pine finish, at $50 per M.	1.50
30 feet lumber, ½" x 6" x 12", poplar panel, at $70 per M............	2.10
1 pair hinges, 2" x 2½", tight pin butts..............................	.15
5 locks, drawer, No. R. A. 342 Yale & Towne, for 1⅛" wood, at $0.70 each....................................	3.50
16 lag screws, ½" x 6", at $0.04 each................................	.65
Carpenter labor..	12.25
Total..	25.00
Extra for maple top..	6.00
Cost...	31.00

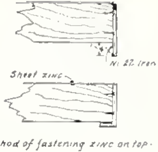
PAINT MATERIAL.

1 quart white shellac..	.75
3 pints coach varnish..	1.20
Total cost...	32.95

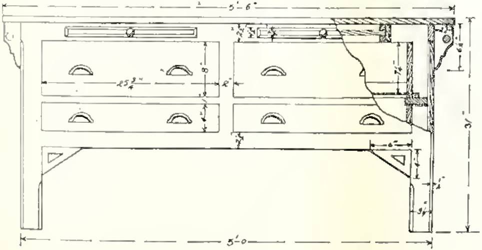


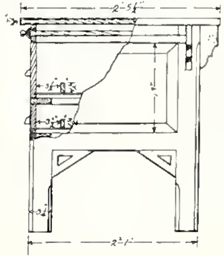
DETAILS OF MANUAL TRAINING WORKBENCH





Method of fastening zinc on top.





Domestic Science Cook Table

[illegible]

4 pieces, 1" x 4" x 2' 9", "A" yellow [illegible]	[illegible]
4 pieces, 4" x 4" x 2' 10", "A" yellow pine [illegible]	[illegible]
6 pieces, 1¼" x 2" x 1' 9", "A" yellow pine finish	[illegible]
4 pieces, 1¼" x 2" x 1' 6", "A" yellow pine finish	[illegible]
2 pieces, 1¼" x 2½" x 1' 3", "A" yellow pine finish	[illegible]
4 pieces, 1" x 1" x 1' 9", "A" yellow pine finish	[illegible]
4 pieces, 1" x 2" x 2' 7", "A" yellow pine finish	[illegible]
2 pieces, 1" x 4" x 2' 6", "A" yellow pine [illegible]	[illegible]
1 piece, 1¼" x 6" x 1' 6", "A" yellow pine [illegible]	[illegible]
16 pieces, 1¼" x 3" x [illegible], "A" yellow pine [illegible]	[illegible]
6 pieces, 1" x 3" x 2' 0", "A" yellow pine [illegible]	[illegible]
4 pieces, 2" x 2" x 2' 6", "A" yellow pine finish	[illegible]
2 pieces, 1¼" x 10" x 2' 5", "A" yellow pine [illegible]	[illegible]
6 pieces, 1" x 4" x 2' 0", poplar board	[illegible]
3 pieces, 1" x 4" x 2' 3", poplar board	[illegible]
4 drawer bottoms, ½" poplar panel, [illegible]	[illegible]
4 pieces, 1" x 10" x 2' 2", poplar	[illegible]
[illegible] for drawer partitions, etc.	

HARDWARE

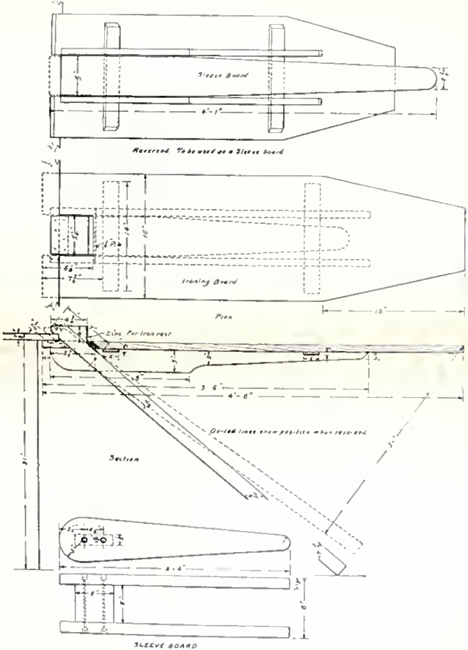
1 piece sheet zinc, 30" x 72"	[illegible]
1 piece iron, No. 22, 1¼" x 1' long	[illegible]
8 drawer pulls	

RECAPITULATION AND COST OF MATERIAL

15 feet lumber, 1" x 4" x 12', "A" yellow pine, at $[illegible] per M	[illegible]
23 feet lumber, 1¼" x 12" x 12', "A" yellow pine, at $[illegible] per M	[illegible]
13 feet lumber, 4" x 4", "A" yellow pine, at $[illegible] per M	[illegible]
4 feet lumber, 2" x 2" x 12', "A" yellow pine, at $[illegible] per M	[illegible]
8 feet lumber, 1" x 10" x 9', poplar, at $[illegible] per M	[illegible]
22 feet lumber, ½" x 6" to 12", poplar panel, at $[illegible] per M	[illegible]
1 piece sheet zinc, 30" x 72"	[illegible]
1 piece iron, No. 22, 1¼" x 16" long	[illegible]
8 drawer pulls, at 10 cents each	[illegible]
Amount	[illegible]
Carpenter labor	[illegible]
Cost of construction	[illegible]

PAINT MATERIAL

1 quart white shellac	[illegible]
3 pints coach varnish	1.20
Total cost	[illegible]



Ironing Board to be Used with Domestic Science Lab. Table